New and Enlarged Edition

HOME ECONOMICS

A PRACTICAL GUIDE IN EVERY BRANCH OF HOUSEKEEPING

BY

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PREFACE

"HOME economics," "domestic science," "domestic economy," and "household economy" are all terms which are applied to the same science (the management of the home). In Europe, where this subject has received much more attention than in this country, the term "domestic economy" is the one generally employed.

Home economics covers a vast field, to which nearly all the arts and sciences contribute. Few women have the time to devote to investigation and experiment in all the lines that bear upon the making of the home. In these days of specializing, it would take a large library and much time to cull from the various sources the kinds of knowledge that bear directly upon the making and the management of the home. The aim of this book is to supply such knowledge in a clear, practical, and concise manner.

There seems to be a need for a book that deals with the necessities of daily home life, that teaches the housekeeper the materials and forces with which she has to deal, and the way in which they should be treated. This book has been planned upon this basis. It treats of the conditions which make the soil under the house and in the immediate neighborhood healthful or unhealthful, the changes in water caused by proper and improper conditions, the sources and characteristics of fuels and oils, besides giving careful consideration to the material that enters into the construction and the furnishing of the home.

The chapters on marketing and carving are planned in a novel way, showing by the skeleton the portion of the bone in each cut of meat. Then are given the position and structure of the muscles of the animal, the changed position of the bones and muscles in the hind quarter when the animal is hung, until the final cutting into joints by the butcher, and the cutting into portions by the carver. Any one who will study these two chapters carefully cannot fail to get a clear and practical knowledge of these two important branches of home economics.

The care of wood finish and of polished floors is becoming more and more a necessary part of the education of the housekeeper. Beautiful floors and finishes are being constantly ruined for lack of proper treatment. The polishing of floors opens a new avenue of employment for careful, intelligent men.

While there has been no attempt made toward giving receipts for cookery, the chapter on foods will be found to embody the principles underlying all good cookery.

Every statement has been thoroughly tested by the author in the years that she has devoted to the study and experiments which have made this volume possible.

MARIA PARLOA.

PREFACE TO SECOND EDITION

Through my magazine correspondence in the past eight years I have been asked for help in solving a great many household problems. Out of the thousands of answers to these questions, I have selected over sixty which apply to problems that are liable to arise in most households.

These recipes will add to the value of the book, and will, I am sure, be appreciated by housekeepers.

MARIA PARLOA.

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CHAPTER I

SOME ESSENTIALS OF THE HOME

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THE house does not make the home, but it has a great influence on the health and character of the inmates. When one lives in a rented house it is not possible to control all the conditions, as one can when building a house; but certainly one should be careful to select a home in a neighborhood where the drainage and water are good, and the people are of a class agreeable to know. If one has children, it is important that the home be near good schools.

SELECTING THE HOUSE

When hiring a house, the would-be tenant should examine it carefully before signing a lease.

Examine the house with care before signing lease.

1. Examine the outside—walls, foundations, underpinning of piazzas, and chimneys, leaders and water-pipes, blinds and fastenings.

2. Examine the cellar—floors, walls, and woodwork. Are they damp or dry? Is there any odor? Are the foundation-

walls and the floors in good condition? Is it well lighted? Are the bins for fuel in a convenient place, and are they ample? Is the furnace in good condition? Are the stairs secure and well lighted?

3. Examine the plumbing. What is the condition of pipes and faucets? Are the flushing appliances wholly separated from the general-supply tank? Is the plumbing properly trapped? Is there any odor from it?

4. Examine the walls to see that there are no breaks in the plaster or paper. Remove drawers to see if the space back of them is plastered; if not, stipulate that this shall be done. Look at the woodwork, floors, and window-casings, looking carefully at locks and catches to see that they are in good condition. Be sure that the house has such an exposure that you get the sun. Better have fewer conveniences with a sunny house than take a house where you get little or no sun, even though with the latter you should get finer finish and more conveniences.

See that lease is satisfactory before signing.

Being satisfied with the general condition of the house, the next care is the lease. In this should be stated the period for which the lease runs, the rent to be paid, the condition in which the house comes into your hands, whether landlord or tenant makes the repairs, and, if the tenant makes any, what they are to be. The water-tax is in some places paid by the tenant, and in other localities by the landlord; have this stated in the lease.

Examine meter before gas is turned on.

Before having the gas turned on, have the meter examined, that you may not have to pay for gas that your predecessor has consumed.

If all these things are strictly attended to at the proper time, they may save you a world of annoyance in the future.

For the benefit of those who may build their own homes a few suggestions are given. There is no intention of hav-

ing these suggestions take the place of an architect; but it is hoped that they will be a help to the would-be builder, in seeing more clearly than he otherwise would what are the essential and what the secondary considerations in the foundation and structure of a house.

SIZE AND STYLE OF THE HOUSE

In planning a building, its special uses must be considered. The house intended for a home should be made as convenient, sanitary, and attractive as possible. The style of the house depends upon the location. The house built in the city or suburbs would, of course, be quite different from that built in the open country. The amount of money one is able to devote to the building of the home must largely decide questions of size, architecture, etc.

Bearing of location upon style of the house.

The simpler the style of architecture, if the lines are good, the more pleasing the effect will be.

Sleeping-rooms should never be planned on the first floor.

Even in the smallest and cheapest houses there should invariably be a chamber, or open space, between the roof and the story below it. Rooms with no intermediate space between them and the roof are apt to be very much like ovens in the hot weather of summer.

Small houses built with low, broken roof-lines are picturesque, but the sleeping-rooms are not likely to be comfortable. Roofs built in such a style, besides being more expensive at the start, are more apt to leak than the plainer ones.

A house built with thick walls will be cool in summer and warm in winter.

Advantage of thick walls.

Every human being is entitled to some space where he can have absolute privacy for a few hours each day. Houses should be planned to give each person a separate sleeping-room. It is better to have fewer parlors and more bedrooms.

Finish of walls and woodwork. The finish of the walls, ceilings, floors, and all woodwork in the house should be as simple as possible; then there will be fewer places for dust to lodge and less chance for disease-germs to develop, the expense of building will be lessened, and the work of the housekeeper simplified.

THE SKELETON AND CIRCULATORY SYSTEM OF THE HOUSE

A modern house might be likened to an animal organism, the framework being the skeleton, and the plumbing, flues, heating-pipes, etc., being the circulatory system.

If this part of the house is carefully outlined before any work is done, it will save much time, labor, and expense in the construction of the building. What is of still greater consequence, every pipe, flue, and wire will be placed in the right position and will be surrounded and supported by the proper material. There will be no tearing out of masonry here, or cutting of floors and walls there—a process of remedying mistakes that often means that heating-pipes are placed in too close contact to woodwork, and that the spaces around plumbing are not properly finished.

Importance of outlining circulatory system.

When there is a clear mental picture of the completed house, it will be possible to dissect it and leave bare the skeleton and circulatory system. Two sets of plans should then be made, one for the framework, piping, and wiring, and the other for the completed building.

Comparative cost of foundation, plumbing, etc. Having decided upon the whole amount of money to be expended upon the house, allow a generous portion for the foundation, frame, chimneys, plumbing, heating, and ventilating. Do this even if the finish must be very plain in consequence. No beauty of finish will compensate for a poor foundation, shaky frame, and unsanitary plumbing and heating arrangements.

Make the skeleton plan somewhat in this style:

Foundation-walls
- Material.
- Depth below the ground.
- Height above the ground.
- Breadth.
- Openings for windows, doors, etc.
- Ventilating-pipes, cold-air box, etc.

Cellar
- Bottom, subsoil, drain, kind of floor.
- Connections with gas-pipes.
- " " water-pipes.
- " " sewer-pipes.
- Cold room.
- Fuel-bins.
- Furnace.
- Closet for preserves, etc.
- Laundry, water-closet (if there is one).
- Foundation for chimneys.

First floor
- Chimneys—openings.
- Position for pipes from furnace or other heating appliances.
- Position for water-pipes.
- " " waste- or soil-pipes.
- " " ventilators.
- " " bell-wires.
- " " windows.
- " " doors.
- " " stairs.
- " " closets.

Follow this plan for the other floors.

THE SITUATION AND FOUNDATION OF THE HOUSE

When deciding to build a house, the first consideration should be its situation with respect to the influence on the health of the family.

The second consideration may be the character of the neighborhood, and convenience to business and other interests and pleasures.

Light, sunshine, pure air, and dryness are the most important factors in maintaining the healthful condition of the house, and they should be supplied in abundance.

Danger to health from soil.

Dampness, coming from the soil under or surrounding the house, is a source of danger, giving rise to consumption, rheumatism, malaria, and kindred maladies.

The nature of the soil on which a house is built is a most important question. The purest soil consists almost wholly of mineral matter intermixed with air and water.

Conditions which cause formation of noxious gases.

Vegetable matter and animal matter are frequently mingled with the soil. Warmth and moisture produce decomposition in animal and vegetable substances, and during the process of decomposition noxious gases are given off. These gases circulate through the porous earth, and when warmed rise, and, mingling with the air, are taken into the system with every breath we draw.

These poisonous gases are diluted with pure air, and therefore work so slowly in the system that we do not realize the damage that is being done until illness develops. Even then we are ready to attribute the cause to anything rather than to the dampness and poisonous gases that come from cellars, drains, cesspools, swampy land, and decaying animal and vegetable substances in and about our habitations.

If the earth under the house is damp and filled with noxious gases, they will naturally rise and permeate the whole house, floors, doors, and walls being no protection against them.

Drainage of cellars.

All cellars built on clay soil should be drained. The best method of doing this is to dig a trench, slanted slightly, in which earthen pipes, properly joined, should be

laid. These pipes must be covered with at least two feet of clay, well packed.

The floor of the cellar should be constructed with the utmost care. No matter what the soil under the floor may be, there is always danger from the gases which will circulate through it. The covering of the floor should be of some substance that will effectually obstruct the passage of the gases rising from the subsoil.

The floor of cellar.

Many of the best authorities on sanitary questions are of the opinion that a thick bed of clay, well packed, is the very best material for a cellar floor. The one objection to this is that the clay, adhering to the shoes of every one who walks over it, is likely to be carried into other parts of the house. For this reason it is well to have the clay floor covered with a layer of cement.

With the subdrain and the clay floor under the cement, the cellar should be dry and sweet, and, as a consequence, the whole house will be in a good sanitary condition.

THE FOUNDATION-WALLS

Next in importance to the soil on which the house is built, and the drainage, come the foundation-walls of the house. They should be so built that there will be no danger of settling because of the instability of the ground. The foundation itself must be constructed in such a manner that there may be no possibility of dampness being drawn into the walls. The subdrain already described will take away the greater part of the moisture from the soil.

Preparing the foundation for cellar wall.

A deep, broad trench should be dug for the cellar walls. The bottom of this should be packed with a thick bed of clay, as was suggested in making the cellar floor. Over this should be put a layer of coarse broken stone, the spaces between the fragments being filled with

crushed stone. The whole surface should be made even, and finally covered with mortar and cement. This foundation will give a solid support for the walls of the cellar.

All cellar walls should be thick. This is essential for the proper support of the house, and, in addition, keeps out heat in summer and frost in winter. In building the cellar walls, every precaution should be taken to make them impervious to moisture.

Lighting and ventilation of cellar. The height of the walls *above* the ground is important. They should extend a sufficient distance above ground to admit of windows at least two and a half feet high. This will insure the thorough lighting and ventilation of the cellar, and the raising of the first floor at least three feet from the ground.

(NOTE.—In some parts of the country, as in a number of the Southern States, for instance, the land is so low that cellars are out of the question. In such cases the foundation-timbers of the house rest upon brick or stone piers. The supports are far enough apart to allow thorough ventilation under the house.)

Secure sunshine if possible. There should be cellar windows on all sides of the house, if the house is detached. If it is in a block, of course these windows are limited to two sides only. Piazzas should not be placed in such a position as to exclude all sun from the cellar.

The more smoothly and completely the walls and ceilings of the cellar are finished, the easier they will be to keep clean. The ceilings should be lathed and plastered.

Use of cellar. The uses to which the cellar is put depend upon the locality in which one lives and the manner of living. In town houses the fuel is usually kept here. In many country houses all the fuel, except the furnace coal, is kept in sheds on the ground floor.

When the fuel is kept in the cellar, it should be stored in bins placed as near as possible to the point of consump-

tion. For example, the furnace coal should be as near as possible to the furnace, and the range and grate coal near the stairs. Bins should be large enough to contain the full yearly supply of coal, and they should be dry and well lighted.

Placing of bins for fuel.

Every cellar in which there is a furnace should have a cold room partitioned off from the main room.

The cold room.

A good plan for the cold room is as follows: Take one corner of the cellar in which there is a window (two windows would be still better); a northeast or northwest corner is most desirable for this room. Inclose a square with walls of masonry, leaving a generous opening for the door and a small space for a window which may be opened and closed at will. Divide this room into two parts, using well-joined boards or masonry for the wall, and again leaving generous space for a door. In any case, have strong supports of some kind on which broad slate shelves may rest. If the walls are of masonry, narrow ledges of stone or brick may be arranged to project from them. If wood has been used, broad, smooth, wooden cleats may be fastened to the walls. In the inner room a strong piece of joisting should be fastened firmly across the room and about two feet from the ceiling. Several large meat-hooks may be driven into this joist, on which may be hung joints of meat, hams, poultry, etc. This inner room may be used for storing meats, fish, fruits, vegetables, and all foods that have an odor.

In the outer cold room milk, butter, and inodorous foods may be kept. These cold rooms should be placed as near as possible to the cellar stairs; if the whole length of the cellar must be traversed to get to them, they will not be used as freely as they should.

The windows of these rooms should be supplied with screens of thin cheese-cloth to keep out all particles of dust; these would be in addition to the coarse- and fine-wire

screens with which all the cellar windows should be protected against thieves, flies, and small animals.

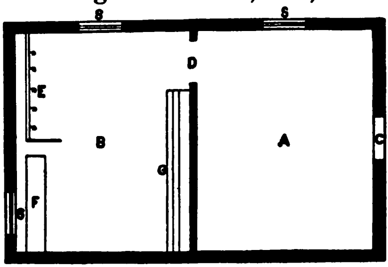

Fig. 1.
A, first room; B, inner room; C, door into cellar; D, door connecting the two rooms; S, S, S, windows; E, joist with meat-hooks; F, table; G, shelves.

Each room should have, besides the windows, a small opening through the outer wall, screened with fine wire, and covered with fine cheese-cloth. This will insure ventilation in cold weather when the windows are closed. The doors of both rooms should be wide enough to admit a large barrel with ease.

A CLOSET FOR PRESERVES AND SIMILAR SUPPLIES

Another useful contrivance in the furnace-heated house is a closet for storing preserves and other articles that should not be kept in a hot cellar, nor yet in a room where there is danger of freezing.

This closet may be built of wood and placed in any part of the cellar. It should be well made, and fitted with broad, smooth shelves that may be cleaned with ease.

GENERAL PLAN OF THE HOUSE

A skeleton somewhat like the following one will save changes, expense, and annoyance:

Outline of what is needed in the house.

1. Cost.
2. Area of first floor.
3. Rooms and closets on first floor.
4. Rooms and closets on second floor.
5. Number of attic rooms, if any, and their arrangement and finish.

6. Amount of plumbing, and its location.
7. Number of chimneys, and their location.
8. Number of open fireplaces.
9. Plan for stairs. (They should be broad and easy, and the back stairs should be free from turns.)
10. Arrangement of the rooms on all the floors. (This should be planned so that those used most shall have the best exposure to the sun. Halls should be arranged so that they may not be simply passageways, but healthful and cheerful meeting-places.)

Rooms.

11. Location of windows, doors, and closets. (These should be planned, after the location of the rooms is fixed, so that they may give the greatest amount of light, sunshine, and air.)

Windows, doors, and closets.

Doors and closets should be so placed that they will break up the wall-space as little as possible.

Ample space should be allowed in bedrooms for bed, dressing-case, and large wash-stand—for it is to be hoped that in our sanitary house there will be no set basins in the sleeping-rooms.

Plan to have all the rooms and the hall on the lower floor connect.

Windows in library.

The library should be well lighted and have ample wall-space for bookcases. It is a good arrangement to have a window on one side of the room above the low bookcases, the greatest length of this window extending horizontally. The glass should be of a soft, warm color. The light coming through glass tinted a deep yellow is almost like sunlight, very much softened.

Corner closet and sideboard built in dining-room.

The dining-room should be one of the most cheerful rooms in the house. In building, the cost of putting in corner closets and a simple sideboard will not be great, if one is satisfied with plain, substantial work. The arrangement of bits of china and

glass in these will be sufficient decoration. Of course, if one is building a handsome house, and has the means to spend on fine carvings, the dining-room and library are the rooms where such work is appropriate and satisfactory. A bay-window in the dining-room will admit of a few plants—the most attractive thing one can have in this room.

Vestibule and entrance-hall.

Let the vestibule and entrance-hall be as spacious as your means will permit. The hall gives character to the house. Nothing in make-up and finish of any other part of the house can atone for a cramped and badly lighted hall. Somewhere on the first floor there should be a closet for wraps, umbrellas, overshoes, etc. With such a place for putting away the outdoor garments, it is possible to make the hall a pleasant reception-room.

Staircases back and front.

The staircase, wherever placed, should be broad and easy to mount, with at least two wide landings to break its length. The back staircase should be built for its proper use—the passing up and down for the performance of the regular work of the house, and for carrying furniture, baggage, etc., from one floor to another. For these purposes the stairs should be *straight*, of an easy incline, and well lighted. As a rule the reverse is the case.

THE KITCHEN AND PANTRIES

Last, but not least, plan carefully for the kitchen and pantries. The kitchen should be large enough to be comfortable as to temperature and ventilation. Arrange it so that nearly all the work of cooking, dish-washing, etc., may be done within an area of one hundred square feet. A rough plan is given here of kitchen, pantries, back hall, and stairs, that may be suggestive of the method of connecting the different points of work closely and systematically. (See

Fig. No. 2.) The kitchen should not be so large as to make the work of keeping it clean a burden, nor so small that it cannot be well ventilated and kept fairly cool.

If the plan given is followed, all the work of cooking, serving, and dish-washing can be confined to a small portion of the kitchen. At the same time the room is sufficiently large to insure a comfortable atmosphere, and there will always be a clear, orderly space, which will be a comfort and convenience when extra work is to be done.

The woodwork in the kitchen should be very plain and it should be finished in oil. There should be no grooves to hold dust or moisture. The walls may be painted, or they may be covered with one of the papers that can be washed. When one can afford it, tiling is the most satisfactory finish for the lower part of the walls, say for a space of from four to six feet. This is an expensive finish at the beginning; but when it is remembered that the first cost is the only outlay, and that the tiles will last as long as the house stands, it will be seen that they are not an extravagant investment. The blue-and-

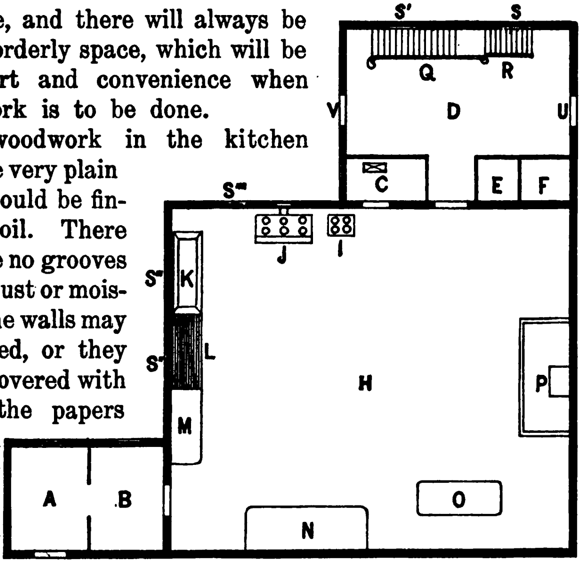

Fig. 2.

H, kitchen; A, B, china-closet and pantry; C, cold pantry; D, back hall; E, F, closets for cleaning-appliances and out-door garments; I, gas-range; J, coal-range; K, sink; L, draining-board; M, table; N, dresser; O, table; P, chest of drawers with shelf above for clock, etc.; Q, back stairs; R, cellar stairs; S, S, S, S, S, windows; U, door into front hall; V, door into back hall.

Tiling for walls.

white glazed Dutch tiles are especially adapted for a kitchen. Yellow tiles will give a warm tone, and when the kitchen is on the north side, or not well lighted, as is the case in many houses in city blocks, this color is advisable.

Floors. The floors of kitchens, pantries, back halls, and stairs should be of hard wood, finished in oil, or stained and varnished. Such floors are easy to keep clean, and there is no temptation to water-soak them.

Windows. The kitchen windows should be large, and should lower from the top with ease. The screens should be made to cover the entire window. There ought to be a flue in the chimney to carry off gases and odors.

Sinks. A generous sink and ample table-room save much breakage and lighten the labor in the kitchen. The sink should be broad, and the water-faucets should be set well up and back. From my own observation, it seems as if the greater part of the breaking and nicking of dishes is done by striking the articles against the water-faucets. **Breakage of dishes.** In a narrow sink the breakage is much greater than in a broad one. When it is possible to avoid it, the kitchen sink should not be made of wood. Those made of soapstone, and other kinds of stone, are excellent. Iron sinks are good, except that they rust easily. If wooden sinks must be used, they should be lined with zinc or some other metallic substance. The porcelain-lined sinks are sanitary and easily cared for. The sink should never be inclosed. The waste pipe should be covered with a fairly fine strainer, which should be kept screwed securely in place.

Draining-shelves. Every sink should have at one end a long draining-shelf. This shelf should be well grooved and inclined slightly toward the sink. If there is space to allow it, have a broad shelf or table at the other end. A low movable table may be kept under this.

In planning the kitchen, leave space for a gas-stove near

the range. A small opening should be made in the chimney for connecting the gas-stove with a pipe which carries off the products of combustion.

PANTRIES

Pantries and china-closets.

A great economy of time, strength, and materials is gained by having ample and well-arranged pantries. To prevent sounds and odors reaching the dining-room from the kitchen, the communication between these two rooms should be through several doors. The plan of pantry and china-closet given below will be found to combine convenience for work and protection against odors and sounds.

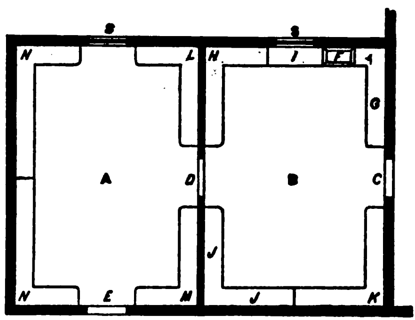

Fig. 3.

A, china-closet; B, pantry; C, door into kitchen; D, door between china-closet and pantry; E, door into dining-room; F, sink; G, table with shelves above; H, broad shelves with closets above and below; I, draining-board; J, J, drawers with closets above; K; broad shelves with closets above and below; L, drawers with shelves above; M, broad shelf with closets below and shelves above; N, drawers with closets above; S, S, windows.

Opening from the dining-room is the china-closet. Here are kept the fine china and glass, the table-ware and silver in daily use, and any table appliances one may wish to have convenient to the dining-room. This pantry is lighted and aired by a small window.

Connecting this pantry with the kitchen, and opening from it, is another pantry, which is a little larger than the first, which contains drawers, closets, and shelves for dishes and such supplies as crackers, sugar, vinegar, oil, and salt, which one likes to have near the dining-room. Here the tableware that must be taken into the kitchen may be kept.

A sink with hot and cold water is provided for the care of the finest tableware, and there is a large stationary table which will be found indispensable in the table service, dish-washing, and arrangement of cold dishes. This room is lighted and ventilated by a window.

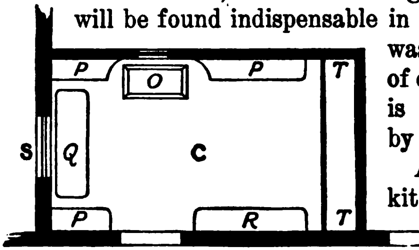

Fig. 4.

C, cold pantry; O, refrigerator-opening for ice; P, P, P, shelves; Q, table; R; shelves with drawers below; S, window; T, T, locked closets.

At the other side of the kitchen is a cold pantry (*C*), where the groceries and cooked food may be stored. A plan of this is given below.

A closet where the brooms, brushes, and all appliances for cleaning the house may be kept is a necessity.

This closet should have one or two broad shelves on which to place the articles used in cleaning, and the cloths for covering furniture and pictures when sweeping, etc. There should be two rows of hooks, one above the other, on which to hang brushes, brooms, etc. (*E*) Figure 5 shows the arrangement of such a closet. Next it is shown another closet (*F*), where wraps for every-day use, overshoes, umbrellas, etc., may be kept.

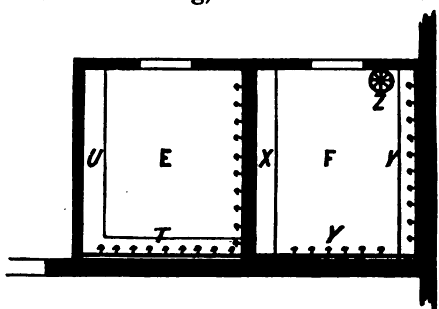

Fig. 5.

E, closet for cleaning-appliances; F, closet for wraps, etc.; T, hooks; U, shelves; X, low shelf for overshoes, etc.; Y, Y, hooks; Z, umbrella-stand.

A dresser is almost a necessity in the kitchen. It is certainly a most convenient and pleasant arrangement, and well merits its name "dresser," for it is an adornment as well as a most useful piece of furniture.

The dresser should be made of the same kind of wood as that in which the kitchen is finished. It should be long enough to divide into several parts. The following plan may be modified to suit varying tastes and needs. The height of the one suggested in the diagram is about eight feet; length, six feet; depth of bottom closet, twenty inches; depth of upper closet, fourteen inches.

Between the upper and lower closets have two drawers, and sliding shelves between the drawers and broad shelf. *A* is the sliding shelf, *B* the broad shelf, *C* the drawer.

Fig. 6.

The shelves in the upper closet should be grooved, so that dishes and plates may be stood on end upon them. Close the closet with sliding glass doors.

If the kitchen is so arranged that there is no place for such a dresser, one may have, at least, a corner cupboard. Cut No. 7 gives a plan for another kind of dresser, which supplies more close cupboards and drawers.

MATERIALS USED IN BUILDING

Naturally, the most durable building-materials are stone and brick, but owing to the expense of these materials and the cost of handling them, wood is generally used for

houses of moderate price built in suburbs and country places.

Whatever the material employed, it should be of such quality and treated in such a manner as to prevent the walls from absorbing or retaining dampness. Bricks absorb

Bricks.

moisture readily. This is particularly true of a poor quality of brick. Therefore, when bricks are used for the outer walls of a house, only those of the best grade should be employed, and the finished walls should be made impervious to moisture by a coat of good paint.

Fig. 7.

If wood is the material used in the structure, it should be thoroughly seasoned (see "Woods") and free from sapwood. Every piece that is exposed to wind and rain should be protected by paint, oil, or some wood preservative. In the interior of the house all the wood finish should be protected by varnish, oil, wax, or paint.

Wood that is used on the outside of the house should be put on so that water *cannot lodge in* or *under* it. It often

Causes of decay in wood.

happens that rain- and snow-water work their way under shingles and clapboards, the flooring of piazzas or steps, and in a short time cause the wood to decay. This decay is contagious, and in time large patches of roof, flooring, or joists are destroyed.

The best material and good workmanship will almost insure against this kind of loss and annoyance.

Any woodwork that comes near the soil, such as steps, piazzas, etc., should be constructed in such a way that thorough ventilation between the woodwork and the earth is assured.

The laying and finishing of floors.

The laying and finish of the floors of the house is particularly important. The wood for this purpose should be perfectly seasoned, and the boards so well matched that neither dust nor water can pass through the joinings. They should be wholly of rift wood, if quartered wood is not used (I am not speaking now of inlaid or parquetry floors).

All floors that are not to be covered with carpets or matting should be finished in such a manner that they will be pleasant to look upon and easy to care for. (See "Woods," "Rift," and "Slash.")

A badly finished floor is a continual source of annoyance, while, on the other hand, the plainest floor of thoroughly seasoned and matched boards, properly cared for and well finished, will be a joy forever.

Doors and window-sashes.

Doors and window-sashes should be substantially and carefully made, and of the best-seasoned wood.

Leaders and water-pipes.

The leaders and water-pipes used on the outside of the house should, in cold climates, be made so that they will not be injured readily by ice. Corrugated pipes, when water freezes in them, do not burst as easily as smooth ones.

Painting exterior of house.

As to the painting, it should be borne in mind that durability is attained in proportion to the amount of lead used. For this reason white, red, and drab paints are the best, as a great deal of lead may be employed in mixing them. The surface should be perfectly dry before paint is applied. If the paint is laid on a damp surface, it will blister and come off in flakes. The most suitable time for painting the out-

side of a house is in the autumn, when the weather is clear and cold.

If the finish of the woodwork of the interior of the house is in the natural wood, it should, when possible, be rubbed smooth with sandpaper before being oiled or varnished. If it is varnished, several coats should be applied, each coat being rubbed down. All of these details add to the first expense; but they will pay in the end, because of the gain in beauty and durability.

Finishing of interior woodwork.

The wood used in all kinds of closets should be free from pitch, and, if painted or varnished, so well done that there shall be no danger of articles sticking to it. Never oil the woodwork in closets.

THE INTERIOR FINISH OF THE HOUSE

So much depends upon the location, the style of house, furnishing, and mode of living, that a few suggestions are all that can be given on this subject.

The interior finish of the house should be in harmony with the location, style, and furnishing. If the house is exposed to strong light and sunshine, the finish should be soft in tone, and free from strong or pronounced colors. On the other hand, in a city block the light and sunshine do not come into all parts of the house either abundantly or strongly. In such a house the finish should be of a kind that will reflect warmth and light, not absorb it. For somber, sunless rooms and halls the floors, walls, ceilings, and woodwork should be as light and warm in tone as possible. Yellow tones light up a room and give a sense of warmth. Red gives a sense of warmth, but does not brighten a room as yellow does. All shades of green are cold, but

Interior finish should harmonize with location, etc.

Lightness and warmth of color.

the lighter they are the cooler the effect will be. Blue is also cold, but less so than green. Browns are somewhat neutral, but give an impression of warmth rather than cold. Olive greens in which the yellow predominates are soft, warm, and restful colors, which may be used in any light or climate.

The general tone in the finish of rooms that have a northern exposure, or that are not well lighted, should be either in dull reds or yellows.

In finishing the walls of a room, it should always be remembered that they are to serve as a background for pictures, furniture, and hangings. For this reason they should be made as soft and neutral as possible. Large and set designs, and pronounced colors, are difficult things to deal with in furnishing a room. Of course the most sanitary finish is the calcimined or painted walls, but as a rule they are cold and hard. A paper in plain color and soft tints never offends or tires the eyes. Cartridge-papers are very satisfactory on this account.

Walls a background for pictures, etc.

The back of very cheap paper will sometimes make a good wall-covering. This is particularly true when the back is a soft écru or buff.

A plain finish is especially desirable for the walls of halls, parlors, libraries, and dining-rooms. Light papers with dainty colorings and designs are appropriate for bedrooms. Papers with set figures or geometrical designs should not be used on the walls of a sleeping-room. If one should happen to be ill for any length of time in such a room, these designs would be a continual torture to the eye. The background of a paper used in a sleeping-room should be of a soft, delicate shade of cream,—or gray is good,—and over this might be running vines, or flowers either single, clustered, or festooned; a frieze of sedgy grass, flags, etc., would be a pleasing

Wall-papers.

finish; and, ill or well, one would rarely tire or be annoyed by the designs or tones in such a wall-covering.

Placing of steam-pipes and radiators. If the house is heated by steam or hot water, the pipes and radiators that are brought into a room should be made as inconspicuous as possible. They should be placed where they will not take up too much wall-space. Sometimes the most desirable part of a room is spoiled by these ugly pipes.

THE CHIMNEY AND FURNACE-PIPES

The first considerations in building a chimney should be safety and the efficiency of the draft.

In the accounts of the burning of dwelling-houses, the cause given for the origin of the fire, in a great majority of cases, is a defective flue. This applies to all classes of houses, from the cheapest to the most costly. Certainly in this day materials and workmanship ought to be of so high an order that it would be almost an impossibility to have fires from such a cause.

The draft depends, to some extent, upon location. When practicable, the chimney should be carried high enough for the top to be free from all obstruction. A chimney whose top is overshadowed on one or more sides by high walls will not draw when the wind is in certain directions.

Height of chimney.

In building fireplaces, every precaution should be taken to preclude all danger of the woodwork taking fire. This may be accomplished by surrounding them with thick walls of brick or other masonry. Deep fireplaces do not heat a room as well as shallow ones, except at the expense of a great deal of fuel. Unless one lives in the country, where wood is cheap, the fireplace should not be very large. The back should slant forward as it rises; this tends to throw the heat into the room.

Fire-places.

Every fireplace should be provided with a damper that may be opened or closed at will. The best finish for the interior is fire-brick. A facing and hearth of glazed tiles is desirable, as they are clean and reflect the heat.

Some safeguards. Hot-air pipes, when passing through walls or floors, should be several inches from the woodwork. If such openings can be plastered, or the pipes wrapped in asbestos, the danger of fire from this cause will be greatly diminished. Use every precaution here.

THE PLUMBING

Stationary basins. The plumbing of the house should be of the best quality, as simple as possible in construction, and there should be no more of it than is actually necessary for the comfort and convenience of the family. Stationary basins with hot and cold water in the bedrooms, and bath-rooms connected with sleeping-rooms, lighten the labor of those doing the work of the household, and they are a great luxury; but they are dangerous things to have in or next to sleeping-rooms. It is better to have bath-rooms as far away from sleeping-rooms as possible, and to put generous, portable wash-stands and bowls in the sleeping-rooms.

Horizontal piping. There should be the least possible horizontal piping laid in the house. Hence, bath-rooms, closets, etc., should be placed, when practicable, in locations on the different floors that are relatively the same. All plumbing should be in sight, and the traps so placed that they may be opened and examined with ease.

Traps and their use. The trapping is one of the most important constructions in plumbing, and only traps of the simplest form should be used. A trap is a U-shaped bend in a pipe. It must always contain a sufficient quantity of water to extend an inch or more above the bend. This

water is termed the seal, and its office is to prevent the escape of sewer-gas from the pipe into the room. There are many kinds of sewer-gas traps, but they all aim at the same result — the water-seal.

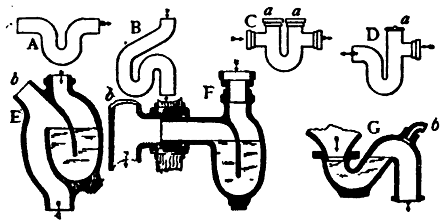

Fig. 8.

A, B, common traps; C, D, modifications of A and B—screw-caps, as shown at *a*, being added for cleaning out the traps; E, F, G, ventilating-traps with air-pipes at *b* leading to the exterior of a building.

The soil-pipe must be thoroughly ventilated, and the ventilating-pipe should be carried well up above the roof, beyond all possible chance of foul air being drawn into the house through the windows.

On the size of the soil-pipe depends much of its efficiency. It should never be so large that it cannot be thoroughly flushed—that is, filled with water, so that every part of it is cleansed as the water flows through. A four-inch pipe is the size generally used; but if the flow of water is not abundant, a smaller pipe would be better. The overflow-pipes of the bowls and bath-tubs of old-style plumbing are most difficult to flush or disinfect. This kind of overflow-pipe is still used in cheap plumbing, but the most advanced plumbers now have much better arrangements, the stand-pipe for bath-tubs being one of the simplest and best. Naturally, every year there are new appliances, or improvements on old forms, and builders should make every effort to get those that are best from the sanitary point of view.

Overflow-pipes.

Flushing of pipes in water-closets.

Each water-closet should be provided with a separate flushing-tank which will hold at least three gallons of water. The flushing-pipe of the water-closet should never have direct communication with the main tank. When this communication exists there is

always danger of contaminating the water supplying boiler, bowls, baths, etc.

When there is but one bath-room in the house, there should be a water-closet on the first or second floor. It is desirable to have a bath-room for the servants, if practicable.

A small room on the first floor with bowl and water-closet will be found a great convenience.

Care in placing of pipes.

The placing of the pipes should be studied with great care. When it can be avoided they should not be put on the north side of the house. A plan of the plumbing should be kept in every house, and the housekeeper should make herself familiar with its details.

The universal motto in regard to plumbing should be: The best, the simplest, and the least possible.

Books on sanitation.

I want here to mention two books which would prove of great value to the householder, if studied with care. They are both so clearly and simply written that any amateur can understand them. One is "How to Drain a House," by George E. Waring, Jr., and the other is "Home Sanitation," edited by Ellen H. Richards and Marion Talbot.

COUNTRY HOUSES—DRAINAGE AND EARTH-CLOSETS

In communities where there are no water or sewerage systems, the problem of the disposal of the sewage is a serious one; but it should not be neglected or ignored, as is often the case. Owing to the habit, prevalent in many country places, of throwing all the slop-water of the household upon the ground near the dwelling itself, poisonous gases are constantly being diffused, and the poison also filters through the earth from these points of deposit into the wells. I suppose it is no exaggeration to say that one half of the people living in country places suffer from impaired health on this account.

Earth as a purifier. Earth has great purifying power. The dirtiest water, after filtering through a large area of earth, becomes comparatively pure. It takes time, however, to accomplish this.

All dirty water should be carried as far as possible from the house. When there is no other means of disposing of it than on the surface of the ground, drains should be constructed of well-joined tiles, and laid in a trench that has a slight downward incline. The trench should be filled in with clay.

Construction of drain for liquid refuse. The outlet of this drain may be on a piece of land distant from the house at least two hundred feet. Every particle of liquid refuse must go into this drain.

Earth-closets. When it is not possible to have a water-closet, an earth-closet should be constructed, with care to have it as sanitary as such things can be made. Each member of the household should be taught how to use the earth, and the necessity of keeping the earth-closet dry.

This closet should be connected with the house only by a covered passage. It should be well lighted and ventilated. The vault must be shallow, with a bottom of well-packed clay. The board that shuts in the vault must be so arranged that it can be easily removed, and it should have two openings cut in it for ventilation.

The contents of the vault must be kept covered with fine, dry earth. If the earth is mixed with powdered charcoal, so much the better. A box of this mixture, and a small shovel, should be kept in the closet. The vault will have to be cleaned frequently. Chloride of lime, or quicklime, might be scattered in the vault occasionally. No liquid should ever be poured into the closet. The secret of keeping it in a sanitary condition consists in keeping it *dry*, and sprinkling in dry earth every time it is used.

CHAPTER II

THE WATER-SUPPLY

Situation and depth of well or spring. Methods of softening and purifying water. Tests for impurities in water.

Do any of us ever realize how dependent we are on water for life and health?

Water is the carrier of food throughout the whole system. Upon its purity life and health depend; if, on the contrary, it is impure, it carries with it disease, and often death.

Pure water a necessity.

It is the duty of every head of a family to see to it that the household is furnished with as pure water as possible.

If the water is supplied to a town by a corporation, the chances are that it is as pure as it is possible to get within a reasonable distance. The great danger is from wells, either in town or country, or from bodies of water into which sewage flows.

The general criterion of pure water is that which is "free from color, taste, or smell, and is cool, soft, bright, well aërated, and entirely free from deposit."

Standard of purity.

This standard is correct as far as it goes, but the condition it describes does not always indicate perfectly pure water. Water may have all these characteristics and yet

hold in solution poisons from decaying organic substances. Strictly speaking, no water is pure, except distilled water.

Our supply of water comes from rivers, lakes, springs, and wells. These sources are fed by the rain and melting snows. Portions of these rain- and snow-waters flow directly from the surface of the earth into rivers, lakes, springs, etc. Other portions filter through the soil.

Sources of water-supply.

That which flows *over* the soil carries with it portions of the loose matter which it encounters in its rush to stream or pond. The water that sinks into the soil filters until it reaches well, spring, or subterranean stream.

In its passage through the soil it may, and usually does, undergo many changes, all depending on what it finds in its travels.

One of the characteristics of water is its solvent power. The purer and softer it is, the greater this power. In percolating through the soil it dissolves many substances it finds there, and absorbs some of them. On the other hand, clean soil—that is to say, soil free from any decaying organic substance, either animal or vegetable—has the power of purifying water, provided the bed of earth through which it percolates is thick enough.

The solvent power of water.

The greatest danger of poison in water comes from the presence of decaying organic matter. The sources of this pollution are many; but the most deadly, and it may be said the most common, are those which might be prevented.

Pollution easily prevented.

When the water-supply comes from wells or springs near a habitation, there is always a possibility of pollution, unless the surrounding soil is guarded with greatest care. All refuse, dry or liquid, from houses, barns, and outhouses, if left where it can soak into the soil, will, if the spring or well is near enough, find its way into the water. This almost invariably means disease, and very often death.

It would fill the souls of many good men and women with horror if they were told that they are slowly, but surely, poisoning their families and themselves with the filth which they throw upon the earth near what should be the sources of the purest physical life. The pile of manure but a few yards away from the well, the slop-water thrown on the ground near the well, the badly constructed drain that allows a portion of the sewage to leak into the earth and in this way reach the water in the well—each of these carries its share of polluting matter. The heaps of decaying matter found about many houses are another source of contamination. It will be seen, then, that to keep the earth clean in the vicinity of the water-supply is of the greatest importance.

Sources of organic pollution.

Water drawn from marshy lands will always contain decaying vegetable matter, and it should not be used for drinking purposes.

Inorganic matter is also dissolved and taken up by water, which invariably contains traces of the inorganic substances over which it flows. Carbonate of lime (chalk) and sulphate of lime (gypsum) are the most common and abundant minerals found in water. It is the presence of these substances which gives us what we call "hard" water. Iron, phosphates, etc., are also found in water, according to the locality over which it flows. Air and carbonic-acid gas are always constituents of pure water.

Inorganic matter in water.

SITUATION AND DEPTH OF WELL OR SPRING

From what has been said, there can be no doubt as to the importance of the location of the well or spring from which the house obtains its supply of water. It is an imperative necessity that the well should be so placed that there is not a shade of a chance of pollution.

Situation of wells and springs.

The depth of the well is very important. A shallow well

is always unsafe, because surface-water, before it has sunk through enough earth for purification, will filter into it. The walls of a well should be cemented so as to prevent surface-water from soaking through them.

Depth of well or spring.

As soft water has the power of dissolving lead in small quantities, this metal should not be used for water-pipes when it can be avoided. Water which has stood in the pipes for any length of time should never be used for drinking purposes or in the preparation of food. It should be allowed to run long enough to empty the pipe before any is collected for use.

Dangers of lead pipes.

There are several kinds of impurities:

1. That which comes from organic substances, be it vegetable or animal.

2. Inorganic matter, such as lime, iron, lead, etc.

3. Water has considerable solvent powers, and as it flows over rocks and through beds of different kinds of soil it dissolves both inorganic and organic substances.

The purest known natural waters contain some foreign substances.

METHODS OF SOFTENING AND PURIFYING WATER

There are several methods of purifying water when it holds in solution or suspension so much foreign matter as to make it unhealthy or difficult to use for domestic purposes.

Methods of purifying water.

1. One of the simplest and most commonly employed methods is to boil the water. This process practically kills all the organic life contained in the water; it also softens the water, if the hardness be temporary.

2. Filtering the water purifies to some extent—that is, all substances held in suspension are filtered out; but it must be remembered that any substance held in solution passes

through, so it is not possible to make hard water soft by filtration.

All natural waters have dissolved in them carbon dioxid, oxygen, and nitrogen. Water absorbs about its own volume of carbon dioxid, about one twenty-fifth of its own volume of oxygen, and a much smaller quantity of nitrogen. These gases give life, sparkle, and a suggestion of flavor to water.

The action of carbon dioxid.

Carbon dioxid has the property of dissolving lime. As the water charged with this gas flows over the beds of limestone and sulphate of lime (gypsum), it dissolves particles of the lime which is held in solution by the carbon dioxid, thus giving to the water the quality we call hardness.

3. There are two kinds of hardness—temporary and permanent.

4. Temporary hardness is due to carbonates. Water flowing over a limestone district dissolves small portions of the lime which is held in solution by the carbonic acid in the water. Now, if the carbonic acid be removed or given something else to work upon, the lime in the water is precipitated. We see this when we boil water and a white crust is found on the vessel in which it was boiled. In Paris, a thick coat covers the interior of the vessel in which water is boiled in a day or two; even the cover of the saucepan will contain a coating of lime where the steam has condensed.

5. When water is boiled for some time the carbonic-acid gas is driven off, and there is nothing to hold the lime in solution, so it drops out of the water. But this gas gives life to water, and by long boiling we lose this, and, naturally, as a beverage it is flat and unpalatable, and the beverages which we make from it are not so bright as those made with water which has been freshly boiled.

If the water is poured several times from one vessel to another, it will reabsorb some of the gases, and the flavor will be improved.

One of the best methods of removing temporary hardness (that due to the carbonates) is what is known as Clark's process. One tenth of lime-water is added to the hard water—that is, one gallon of lime-water to every ten gallons of hard water. (See "Lime-Water.")

Removing temporary hardness.

Removing permanent hardness.

When the hardness is permanent it is softened by the addition of sal-soda. However, enough of this chemical cannot be used to soften the water employed for cooking purposes, but it is valuable as an agent for softening the water employed in washing and cleaning.

Purifying by coagulation.

When water contains organic matter, anything that will coagulate the albuminous substance in the water will tend to purify it. Alum, oak chips, and certain kinds of nuts have the property of coagulating albuminous matter, and the precipitate carries down other impurities.

Water taken from marshy land, ponds, or rivers, in which decaying organic substances are dissolved, should be purified by the addition of oak chips or alum. When the water becomes clear it should be filtered or strained. Use about eight grains of alum to a gallon of water; if the oak chips are used, a handful to about two gallons of water.

When a filter is not employed in the kitchen, all the water used for drinking and cooking may be strained through a flannel bag—small bags with running-strings, which may be fastened on the faucet. They should be changed every day.

TESTS FOR IMPURITIES IN WATER

Church gives the following simple tests, which may be made in any kitchen, for impurities in water:

By evaporation.

"Boil one quart of the water to be tested in a porcelain dish, and then heat the dry residue hotter and hotter. If the original residue is white and powdery in appearance, that is, so far, a good

sign; but if it is partly white and partly yellowish or greenish, and especially if there are gum-like stains around the residue, then, on heating these parts of the residue, we shall probably see them darken, fuse, and burn away in part, giving out fumes having a disagreeable smell. If the blackening is considerable, much organic matter is present; but if the smell is offensive (like burnt feathers), then it is certain that the organic matter is of animal origin, and is, therefore, more likely to be unwholesome, or even poisonous."

"If water contains substances derived from the decay of animal or vegetable matters, such as those in sewage and manure and the refuse of plants, then it is found that such a water will destroy the beautiful purple color of a chemical substance called permanganate of potash. The reason for this is as follows: The decaying organic matter of the water attracts oxygen strongly when it is presented in certain states or forms. Now, a solution of the above permanganate contains much oxygen just in the right state to be attracted and removed. By its removal from the permanganate the composition of that substance is altered and its color destroyed. The more organic matter in the water, the more permanganate will be decolorized. The test may be thus applied: Fill a clean white tea-cup with the water to be tested. Add about sixty drops of weak sulphuric acid; stir with a clean slip of window-glass. Now pour in enough of a weak solution of permanganate of potash to render the water a rich rose-color. Cover the cup with a clean glass plate. Now, if there be much organic matter in the water, the color will go in a few minutes, and more permanganate may be added, and still lose its color. It must be recollected, in using this test, that peaty matter and iron salts, which are not necessarily unwholesome, give the same results."

By permanganate of potash.

"Nearly fill a clean tumbler with water, and then add

twenty drops of nitric acid, and five of a solution of nitrate of silver (lunar caustic), or else a small crystal of that substance. Stir with a clean slip of glass, and if there is more than a slight bluish-white cloudiness, if there is a solid curdy substance found, then there is too much common *salt* in the water. It may be said, What harm is there in common salt? We answer, None in the common salt as such, but only in common salt as evidence of some kinds of pollution. We will explain. Common salt (chloride of sodium) does not occur in rain-water or pure well-water, except to the extent of a little over a grain per gallon. Of course there is more in waters from salt-bearing rocks and in waters near the sea. But generally,—at all events, in a chalk or limestone district,—where common salt is found in any quantity exceeding one and one half grains per gallon, which gives a mere cloudiness with nitrate of silver, the salt is derived from sewage—in other words, from the salt consumed in human food and voided chiefly with the urine. If a water be found to contain both organic matter and common salt, it is probably contaminated by house or town sewage. If organic matter be abundant, but accompanied by a smaller quantity of common salt, then the source of pollution is rather the excrement of farm animals than of man, or it may arise merely from vegetable refuse."

By nitric acid.

CHAPTER III

FURNISHING

The hall. The dining-room. The library. The living-room. The parlor. The bedrooms. The kitchen. Kitchen utensils. Tinware. Ironware. Granite-ware. Woodenware. Earthenware. Stoneware. Miscellaneous. Ventilation.

The furnishing of the house should be within one's means and in harmony with the structure. It is possible to furnish a home comfortably, and even elegantly, for the same sum that is often spent in producing the most commonplace and uncomfortable results. The beginners in housekeeping should, first of all, decide upon the amount of money they can afford to spend in furnishing; next they should make a list of the essentials; then another list of desirable accessories should be made out; finally, they should agree to buy the essentials first, to have them of as good material and workmanship as can be afforded, and to select form and colors that will be simple and quiet rather than elaborate and striking.

The essentials in furnishing.

It is hardly possible to estimate the influence that the furnishing of a room has upon the feelings and character of the inmates.

Every article in a room should have a reason for being there. The thing that supports real weight or pressure should have the appearance of being able to do so without any strain upon itself or danger to the object supported.

A chair or couch should *look* strong enough to sustain the weight of any one who sits on it. A table on which many articles are placed, as a five-o'clock tea-table, for example, should be broad and firm, and should not give the impression of being too small or too delicate for its burden. On the contrary, the table on which the fragile vase of flowers is placed is all the more appropriate and attractive if it is of a delicate, airy construction.

Every article of furniture should be adapted to its special use.

Draperies should indicate that they are used to soften the light, replace doors, or give softness or color to some part of the room. Pictures and ornaments are to give pleasure to the eye, and they should be of such a character, and arranged in such a manner, that they will accomplish this result.

Pictures and ornaments.

THE HALL

It is the hall that gives the first impression of the home. Of course the furnishing of it must depend upon the style and size of the house and upon the character of the room. Oak is, as a rule, the most satisfactory wood to use here. If the hall is one of the narrow passageways so often found in city houses, a hall-stand, composed of seat, mirror, and umbrella-stand, and having several hooks to hang hats and wraps upon, is the extent of the furniture that can be allowed.

The furnishing of the hall.

If the size of the hall will permit, it is best to furnish it as a reception-room. In that case, a table, chairs, hall-settle or a plain sofa, mirror, pictures, and, if there is room, a small bookcase, will make a comfortable and charming room. A fireplace usually includes a mantel-shelf on which some ornaments may be arranged. A clock is always appropriate in a hall. The floor, if possible, should be of hard wood, and rugs may be laid on it here and there.

THE DINING-ROOM

The floor of this room should be of hard wood. The table and chairs must be well made and of generous size. It is impossible to arrange a narrow table in an elegant manner, and nothing is more uncomfortable than small, unsubstantial dining-room chairs. When the sideboard is built into the side of the room, the table and chairs will be all the necessary furniture. If there is no sideboard, and the expense of one cannot be incurred, a sideboard-table, which may be covered with a pretty cloth, will do to hold the odd bits of tableware one always wants in the dining-room. A mantelpiece and one or two cupboards give an opportunity of displaying pretty bits of porcelain and glass to the best advantage. Nothing one may put in the dining-room will add such brightness and charm as closets or cabinets, through the glass doors of which the brilliant glass and china may be seen. Growing plants and pictures are always a pleasing addition to this room, which should be one of the pleasantest in the house.

Finish and furnishings.

THE LIBRARY

The ideal library is a room in a quiet corner of the house, with bookcases built around the walls, not too high, so that the titles of the books may be read by a person standing on the floor. As wall-space is of great value in this room, there should be only one large window. The principal light should come from windows above the bookcases. The floor should be of polished wood, and the walls painted or papered in rich, warm colors. An open fireplace, a library table of generous size, a desk, comfortable chairs, a window-seat, a couch with pillows, rugs,

An ideal library.

etc., all should find a place in this room. It will be made doubly attractive and instructive if there are some classical pictures and a few casts. The whole atmosphere of a library should suggest thought and study.

THE LIVING-ROOM

In every house there is one room in particular where the members of the family assemble in their hours of leisure. This room is known as the living-room or sitting-room. In many homes it combines parlor or drawing-room, sitting-room, library, and reception-room. When this is the case it is apt to be an exceptionally delightful place; in any case, it ought to be the most attractive room in the house.

What constitutes comfort in the living-room.

Here there should be the best light, the greatest amount of sunshine, the most pleasing and refining pictures, the easiest chairs, the most cheerful fire, and books, tables, foot-rests, etc. In a room of this kind there should be a large center-table, with a good lamp or drop-light. If the family is large, one or two smaller tables, on which student-lamps are placed, will be of the greatest comfort. Even if there is a library, this room must have a bookcase filled with miscellaneous literature.

A closet where newspapers, magazines, games, work, etc., may be kept will be found a great convenience. If there is no closet, some arrangement should be made for keeping these things. One so often wants to refer to back numbers of papers or magazines that these periodicals should be kept in an accessible place for a certain length of time.

Another convenience in such a room is the box-seat. Any room used as much as this is sure to be should have a polished floor, and there should be a generous supply of rugs. All the furnishing should be of the most substantial and comfortable kind, with nothing too good for constant wear

and exposure to light and sunshine. Anything that has to be protected by scarfs or tidies is out of place here. Well-made ratan chairs, cushioned in seat and back, are light, clean, and comfortable.

Substantial furniture in the living-room.

It seems a pity that so many people still cling to the rocking-chair. It takes up a great deal of space, and the rockers are always in the way, and are continually being pushed against furniture and baseboards, where they often do much damage. The half-reclining position which is the inevitable attitude assumed in this chair is not graceful, nor is it comfortable if one wishes to work or read. Besides, many people become inexpressibly nervous when they are in the same room with a person who is constantly rocking. Indeed, it is an absurd sight to see grown people rock as if they were little children amusing themselves with a toy horse.

The most comfortable chairs.

The style of chair that, in the end, is the most comfortable, and that cultivates the best carriage of the body, is one with a broad, deep seat and a high, almost straight back. Such a chair will sustain one in an erect position, which should be the natural one when sitting down for work or reading. A few low reclining-chairs should also be provided, and a broad, low couch with plenty of pillows gives an air of comfort to this room.

Color in the living-room.

The color of the walls, draperies, and furniture of the living-room should be soft, quiet, and restful. Some of the sofa-pillows, however, may be of rich and brilliant hues.

THE PARLOR

In some of the most delightful houses in this country they have dispensed with the parlor, the library and large living-room serving for family and friends, while a small reception-room is used for ceremonious callers.

A parlor should be elegant and dainty. The tints of walls, ceilings, and carpets should harmonize and be in delicate tones. The furniture should be light and elegant, the draperies rich, and pictures and ornaments good, even if that means very few of them. Really, unless one has a large establishment, it is best to omit the parlor. Its place may be supplied by a small reception-room, daintily furnished. The money that would be expended on the parlor may be used to far better advantage in the living-room, library, and other parts of the house.

THE BEDROOMS

The furnishing of these rooms is as important as that of any other part of the house. It is in the sleeping-room that one must get an interval of that absolute physical and mental rest which every human being requires during the twenty-four hours of each day.

Necessity of healthful sleep.

In sickness or health, there is no food or medicine that has such an influence on the physical and mental condition as restful slumber. Not one person in fifty realizes the great importance of favorable conditions for healthful sleep. Without this restorer of tired nature we become nervous, irritable, and disagreeable to ourselves and those about us. Certainly everything should be done to make the qualifications for sleep as nearly perfect as possible.

Separate beds in sleeping-rooms.

Two people should not occupy the same room unless it is absolutely necessary. If this is unavoidable, however, there should at least be separate beds. The individual bed is not a difficult problem in these days of dainty enameled-iron beds, which can be had at low prices, and of the beautiful brass beds for those who can afford them.

The most desirable floor for the bedroom is the well-fin-

ished one of hard wood. A poorly finished pine floor may be covered with a good matting, under which a smooth lining of paper or some other material should first be laid down. Never nail a woolen carpet on the floor of a bedroom. Rugs, large or small, that may be shaken and aired frequently in the open air, may be used to give a look of warmth and comfort that one likes in winter in our northern climate. Woolen stuffs absorb dust and odors, and they should not be used if they cannot be subjected to frequent dusting and airing.

The best floor for bedrooms.

The light in the sleeping-room should be softened by shades and draperies. It is well to have two sets of shades at the windows, one set light in color, and the inner one a dark green, which may be drawn down at night, if necessary. The draperies should be of some soft, light, washable material.

Best light a softened one for sleeping-room.

The necessary furniture for a bedroom is a bed, dressing-case, one or two plain chairs and one easy-chair, a wash-stand of generous size, a toilet-set, a towel-rack, and a table. In addition to these things, if there is space and one can afford the extra outlay, a couch with a few pillows is a most desirable piece of furniture. A large mat of Japanese matting, or a Japanese cotton rug, should be placed in front of the wash-stand, whether the floor is polished or covered with matting. Another piece of furniture that will be of great service is a large screen. This may be used at night to prevent the wind from blowing directly on the sleeper, and in the daytime to shut off the corner where the toilet arrangements are kept. Of course the room will be all the more charming and convenient if there are pictures, a few book-shelves, and a writing-desk. Such a room may be kept in an absolutely sanitary condition with very little work.

How to furnish a bedroom.

The most important article in the bedroom is, of course, the *bed*. The perfect bed will support all parts of the body

in an absolutely horizontal position. Firm springs and a good hair mattress will do this. The heavier the person who sleeps in the bed, the more important it is that the springs shall be strong and firm. If economy must be considered, let it be in the bedstead; the springs should be as good as possible.

How the bed can be made absolutely comfortable.

Nothing could be simpler or more sanitary than the iron or brass bed, with the woven-wire springs fastened to an iron frame. The only objection to the woven wire is that it is apt to sag—an almost unpardonable fault in a bed. But when the wire is of extra good quality, closely and firmly woven, and attached to an iron frame, it makes an excellent foundation for a single bed. If a thick, well-made mattress is placed on this, the bed will be very comfortable. The best arrangement, however, is to have a rather hard mattress, of excelsior, for example, with a good hair mattress on top. This gives a bed that will sustain the body at every point of contact, and which will be soft without yielding. Everything else being equal, one should get perfect rest on such a bed.

Mattresses.

It may be thought that two hair mattresses would be better than one hard one and one of hair, but this is not the case. I am convinced that half the unrest, sleeplessness, and backache with which people are afflicted is due to the fact that most of the beds in use do not support the body in a perfectly horizontal position. Heavy people are the greatest sufferers, for the middle of the body sinks into the yielding bed, and is at an angle where it should be straight so as to give perfect freedom to the internal organs. If one cannot afford hair or wool mattresses the excelsior mattress may be made more comfortable by laying a thick pad upon it. The pad may be made like a comfortable, of cotton-batting, covered with white cotton cloth. It should be as wide and as long as the mattress and quite thick.

People who have been accustomed to a very soft bed may object, at first, to a support that yields only slightly; but once having given it a thorough test, they will never be willing to sleep on any other kind of bed.

Teach the children to sleep on a firm bed, and with only the thinnest kind of a pillow, if any, under the head.

Children should be taught to sleep in an almost perfectly horizontal position.

Pillows.

The question of pillows is an important one also. It is difficult to induce one who has acquired the habit of sleeping on high pillows to change to low ones. But the reason for making such a change is based on a hygienic principle. When one is bolstered up in bed it is impossible to relax all the muscles, a thing which can only be done when the head is almost on a level with the rest of the body. One should gradually accustom himself to sleeping with the head low. The pillows may be lowered a little each week until the desired point is reached.

Length of sheets of importance.

The length of the bed and the length of the sheets are two important factors in the comfort—or discomfort—of the sleeper. The measurement of the bed on the inside should not be less than seventy-eight inches. The finished sheet should measure at least two and three quarter yards. This will admit of the sheet being tucked well under the bottom of the mattress, and of there being enough at the top to turn back and prevent the blankets from coming in contact with the face and hands.

Some housekeepers are particular in this respect with all the beds except those occupied by the servants, to whom they give sheets of the smallest possible dimensions. It should be remembered that the generous sheet adds not only to the comfort of the sleeper, but that it also is a protection to the bedding.

Coverings should be as light as possible, and of a material that will insure ventilation. There is nothing better than the washable woolen blankets.

A word as to the quality of the blankets. There is no question but that the all-wool blanket, being warmer and lighter, is more desirable than one of cotton or of wool. The only advantage of a mixture of cotton and wool is that the blanket does not shrink so much in the washing; but if the work is properly done there need be no perceptible shrinkage in the woolen ones.

Blankets.

There are blankets that are so fine and costly that one hesitates to have them washed, or even cleaned, often. Such blankets are generally protected by a cotton or linen cover, and can be used a long time without cleaning. But even if these blankets do not become soiled, after a while they will have absorbed impurities from the body, and they should have frequent and thorough airings. The better plan is to have less costly coverings, that may be washed at least once a year.

The making of the bed is quite as important as any other matter connected with it. Everything possible should be done to prevent discomfort and restraint. In the following directions, it is the sleeper who is considered, and not the style of the bed.

Importance of a well-made bed.

1. Spread the under sheet on the mattress, getting it perfectly smooth. Tuck it in all around.

2. Spread the top sheet on smoothly, having enough to tuck in generously at the foot. After tucking the sheet under the foot of the mattress, pull it down a little from the top, that it may not be too tight over the feet of the sleeper.

How to make a bed.

3. Put the blankets on, having the *first* one come well down over the end of the mattress; lay the others even with the end of the mattress. If the blankets are double, see that the open end is toward the head of the bed, so that half of the blanket may be turned back if one wishes.

4. Tuck the top sheet and the blankets in at the *side* of the mattress, not *under* it. This leaves the covering free.

5. Put on the pillows and spread. How this shall be done depends upon the mistress of the house. Taste and fashion vary in these matters constantly, and they are of no vital importance. Still, system and care are essential, that the bed may look neat and attractive.

Protection and care of mattress.

The mattresses should be protected by large cases of bleached or unbleached cotton cloth. Wide cotton should be procured for this. In measuring for the width of the case, allow for the width and the depth of the mattress; in measuring for the length of the case, allow for the length and the depth of the mattress. Thus, if your mattress is seventy-six inches long, forty inches wide, and eight inches deep, you will require five yards of cloth fifty inches wide. This allows for the seams in making, and for some slight shrinkage. Fold the cloth together, and stitch it, leaving one side open. Slip the mattress in at the open side, and sew it up. This sewing may be like strong basting; for the covers should be taken off and washed twice a year.

The mattresses for a double bed should be in such a form that the wear may come on all parts equally. For this reason it is a good plan to have the mattress made in two parts, one a square and the other an oblong. The oblong should be as long as the square, of course, and wide enough to fill the space between the edge of the square and the foot of the bedstead. If the square is turned about from day to day, and the oblong piece is sometimes at the foot and sometimes at the head, the wear on all parts of the mattress will be equalized.

The one objection that may be raised to this arrangement is that the seam where the two pieces come together is sometimes annoying. To obviate this, a thin comfortable, made of cotton-batting and white cotton cloth, may be spread over the mattress.

If the springs are not covered, there should be a covering

of some washable material—strong unbleached cloth, for example. Springs that are of a style that will admit of their being slipped into a casing may have a covering made like that described for mattresses. If this cannot be done, have the cover so made that it will cover the ends and sides of the springs, and fasten it on with tapes. All springs should be covered for the protection of the sheets and blankets.

Covering for springs.

Points to remember.

1. Have mattress turned in different direction each day.
2. Spread under sheet smoothly over mattress, tucking it under the mattress.
3. Spread top sheet so as to tuck in well at foot.
4. Blankets with free ends at the head.
5. Fold sheet over blankets, then turn both back in a fold. Tuck in at sides of the bed, *not* under the mattress.
6. Put on spread and pillows.

THE KITCHEN

So much of the health and comfort of the family depends on the kitchen that the most careful thought should be given to its furnishing.

Fuel for cooking purposes.

First in importance is the range. As far as cooking appliances are concerned, we are now in a transition stage. With the exception of some localities far back in the country where it is still used, wood as a fuel for cooking has not been employed for many years. Anthracite coal takes its place in some parts of the country, and bituminous coal in others. For the last twenty years gas as a fuel for cooking purposes has been growing in favor. Various forms of petroleum are also used. Electricity is now preparing to enter the field as a powerful rival of all the other fuels. The costliness of the cooking apparatus which it requires seems to be the only obstacle in the way of its speedy adoption. This objection will, no doubt,

be eliminated in time. Certainly, for the great majority of householders, coal will be the fuel for a long time to come.

Whatever fuel is used, let the range be one of the best in the market. This is a true economy.

The range. The necessary qualifications of a good range are:

1. That the draft shall be perfect.

2. That checks and dampers shall be so arranged that the heat may be increased or decreased at will.

3. That there shall be ample oven-space.

4. That it is possible to make the oven as *hot* on the *bottom* as on the top.

5. That there shall be a good arrangement for broiling.

6. That the fire-box shall be large enough to take in sufficient coal for the work to be done without being filled to the top.

7. That a large part of the top surface of the range may be made hot enough for the boiling of liquids.

8. That the grate shall be of a kind that will admit of the bottom of the fire being cleaned without the use of a poker. (The Dokash and Duplex grates are both excellent.)

9. That the water-back is so arranged that an abundant supply of hot water may be assured.

Gas-ranges. If a gas-range is to be used, see that the oven accommodations are ample, that there is a good place for broiling, and that there is room enough on the top of the range for boiling, stewing, frying, etc. Be sure that there is one small burner, or even more, for simmering.

The gas-range should have a small pipe entering the chimney to carry off the products of combustion.

The pipe which supplies the gas to the range should be of iron, and large enough to insure a sufficient flow of gas when all the burners are in operation.

Ample table-room in the kitchen simplifies the work. The tables should be strong and well made. A white table is very attractive, but it means a great deal of care. If the

table is covered with white enameled cloth, it will always look well, and it may be kept clean with little labor, provided hot dishes are not placed on it.

Kitchen tables.

No matter what kind of tables are in use, there should be several smooth hard-wood boards to receive the hot saucepans. These boards may be scrubbed clean in the sink every day.

In large households where a great deal of cooking is done a table covered with zinc is most useful.

Other conveniences for the kitchen.

A clock that is an accurate timekeeper is a necessity in the kitchen. There should be a few strong chairs, and one comfortable chair, and a shelf for cook-books and other reading matter. A slate and pencil for writing down the daily orders will be a convenience, and there ought to be an arrangement for hanging dish-towels to dry in wet weather. A coal-hod, shovel, tongs, broom, long-handled and short-handled brushes, dust-pan, draining-rack, hand-basin, a fiber pail, and a tea-kettle will complete the necessary furnishing of the kitchen.

KITCHEN UTENSILS

The necessary kitchen utensils.

The number of cooking utensils, and the most desirable materials for them, are difficult questions for the housekeeper to decide at any time; but to the beginner they have an added importance, as the drain on the purse must usually be considered. It is a mistake to fill the kitchen with all the utensils one may think she will be apt to need in the future. It is wiser to get the necessary articles first, and to have them of the best quality and the simplest construction. Utensils with the smoothest possible surface, and no more coils or grooves than are absolutely necessary, are the easiest to keep clean, and will be found to last the longest, and are therefore an economy in time and money.

There are several qualifications that are desirable in cooking utensil:

Desirable qualities in cooking utensils.

1. Smoothness.
2. Ability to stand high temperature without cracking, melting, or becoming rough.
3. Imperviousness to the absorption of grease or flavors.
4. Inability to impart flavor to, or to discolor, food substances.

Why iron and steel are desirable.

There are not many materials that combine all these qualifications. Iron and steel are desirable materials because they can sustain a high temperature without injury, and if properly cared for they grow smoother and finer with use. For these reasons iron is the most satisfactory metal for the following articles: frying-kettles, frying-pans, omelet-pans, waffle-irons, etc. Iron utensils should not be used for cooking fruits, or similar articles into which acids enter, as they will discolor the preparation and spoil the flavor.

Granite or enameled ware.

The various kinds of granite or enameled ware, if of the first grade, are generally very satisfactory. The surface is smooth and the utensils are light.

Tinware.

Tinware is most useful for certain purposes. It must be remembered that this metal melts at a rather low temperature, *i. e.*, 442° F., and it should never be exposed to a high temperature, such as is necessary, for example, in frying; nor should it be placed over the fire or in the oven without being covered with water, or some liquid in which water or milk enters. Water and watery substances tend to reduce the temperature, while fatty substances tend to raise it. (See "Temperature of Fats and Other Substances.")

Pewter and Britannia.

Pewter and Britannia both melt at a low temperature, and should be used only for such purposes as do not require a dry heat. These metals make satisfactory tea-pots, dish-covers, etc.

Woodenware. Woodenware absorbs odors and fats. Articles made of this material, when used as receptacles for cereals, are apt to become filled with weevils. The use of woodenware, therefore, for such purposes should be limited to the few articles that can be made of no other material.

Stone- and earthenware for ordinary purposes. Stone- and earthenware and common crockery answer for all ordinary purposes. For baking-dishes which are sent to the table, there is nothing more satisfactory than the French fire-proof ware. It is durable and keeps its color; the glaze does not crack, and the ware does not absorb odors.

The following is a list of the utensils needed in the kitchen:

TINWARE

Steamer large enough to steam puddings and brown bread.
2 sets of stamped muffin-pans, one containing 6 or 8 cups, and the other 12 cups.
4 cake-pans, XXX tin.
4 deep plates.
Molds for puddings and creams.
2 graduated quart-measures.
2 graduated measuring-cups, one divided into thirds, and one into fourths.
6 milk-pans (these are useful for many things).
2 dish-pans.
Long-handled dipper.
Coffee-biggin.
Purée-sieve.
Fine sieve.
Coarse strainer.
Fine strainer.
Coarse grater.
Fine grater.
Flour-scoop.
Sugar-scoop.
Boxes for sugar, rice, hominy, meal, etc.
Tea-canister.
Frying-basket.
Spice-box.
Bread-box.
Cake-box.
Biscuit-cutter.
Tin pails for keeping drippings and fats to be used for frying.

IRONWARE

- Scotch bowl for frying. No. 3 or 4; size depends on use.
- 2 omelet-pans of French polished ware or English hammered ware.
- 2 roasting-pans.
- 2 frying-pans, small and large.
- Short-handled frying-pan, that may be put in the oven.
- Skewers (steel).
- Waffle-iron.
- 3 double broilers—meat, fish, and toast.
- Soup-pot.
- Griddle.
- Meat-rack.
- 3 bread-pans.
- Set of roll-pans.
- 2 porcelain-lined kettles.

GRANITE-WARE

- 8 stew-pans, ranging in size from one holding 1 quart to one holding 2 gallons.
- Colander.
- 2 double boilers, 1-quart size and 2-quart size.

WOODENWARE

- Flour-sieve.
- Cover for flour-barrel.
- Molding-board.
- Board on which to cut meats.
- Rolling-pin.
- Board on which to cut bread. and 3 boards to use on cooking-table.
- 6 wooden spoons.
- Vegetable-masher
- Chopping-bowl.

EARTHENWARE

- 6 bowls, ranging from 1-quart size to 6-quart size.
- 6 white bowls, ranging from 1-pint size to 1-quart size.
- 6 cups and saucers.
- 6 white pitchers of various sizes.
- 12 dinner-plates.

12 breakfast-plates.
Several platters and small dishes to use in putting away food.
2 or 3 pudding-dishes of various sizes.
Molds.

STONEWARE

Several pots of various sizes for use in keeping butter, salt-pork, moist cake, etc.
Jugs for molasses, vinegar, etc.

MISCELLANEOUS

Vegetable-slicer.
Palette-knife.
Bread-knife.
Butcher's knife.
Vegetable-knives.
Large fork.
Common knives and forks.
Egg-beaters.
Steel dish-cloth.
Steel skewers.
Soap-shaker.
Teaspoons.
Table-spoons.
Strong iron spoons.
Lemon-squeezer.
Good scales.
Mortar and pestle.
Coffee-mill.
Tea-pot.
Coffee-pot.
Funnel.
Salt-, flour-, and pepper-dredgers.
Ice-pick.
Skimmer.
Cake-turner.
Can-opener.

All cooking utensils should be of as simple construction as possible, but the material and workmanship must be of the best. This is the wisest economy in the long run.

How tin utensils are made. Nearly all tin utensils are made by pressing thin sheets of sheet-iron into the required shapes, which are then dipped into a bath of liquid tin. Cheap tinware is made of a poor, light quality of sheet-iron, and has merely a thin plating of tin, which soon wears off,

making the utensils useless. If tin is cleaned with a gritty substance, like sand, or scraped with a sharp instrument, like a knife or steel skewer, the thin layer of tin is apt to be cut through to the sheet-iron, and the result is fine lines of rust on the article.

Cleaning tin with sand.

It is always best to buy *block*-tin, as then you are sure of getting a pure, substantial article. Utensils made of heavy block-tin cost two or three times as much as those of poor, light, and often impure tin, but they will wear five or six times as well.

Block-tin.

Enameled wares, such as granite-ware, blue enamels, etc., are made of iron, more or less heavy, coated with a preparation which is allowed to dry and is then fused at a high temperature. These articles differ greatly in quality, as is the case also with the tinware. In purchasing any kind of enameled ware, each piece should be examined carefully to see that the enamel is perfectly smooth. If it is cracked or chipped in the least, reject it, for it will not wear well. Manufacturers separate all such pieces from the perfect ware and sell them as seconds. Dealers will often assure you that these seconds are just as good as the perfect ware, except in appearance; but this is not true.

How enameled wares are made.

Grades of enameled ware.

All enameled ware should be made of a firm, unbending material. The slightest bend causes the enamel to crack, and it then chips off. See that stew-pans and other utensils in granite-ware or blue and white enamels are firm and of good weight. Enameled spoons are not satisfactory, because they are apt to bend and crack. For all stirring and beating the wooden spoons are best. When a large, strong spoon is required, well-tinned iron spoons are the most satisfactory. Measuring-spoons should be well-plated table-spoons of the usual size.

Qualities necessary in enameled ware.

Ironware is most satisfactory for many purposes. The

only objection to it is its weight and the extra work needed to keep it clean. The longer iron is used, the smoother and more valuable it becomes. Next to copper, it is the best material for retaining heat, and for this reason it is well to have a few stew-pans and the soup-kettle of iron.

Advantages of ironware.

Porcelain-lined kettles. Porcelain-lined kettles are very good, if properly treated; but if abused, the lining soon breaks and the kettle is useless.

Copper utensils. Copper requires too much care, and is too heavy, for use in the ordinary household.

Yellow earthenware. The yellow earthenware is generally finished very smoothly, and makes excellent mixing-bowls. It is made of a softer paste, and is fired at a lower temperature, than the white stone china, and so breaks more easily. Therefore, although the first cost of the white stone china is greater, its durability makes it cheaper in the end.

Receptacles for food. Receptacles for food should be made of a substance that will not harbor insects. Tin, stone, earthenware, and glass are the best materials for this purpose. Wooden receptacles should only be used when these other materials are too costly or are impracticable.

Stone- and earthenware absorb fat. Stoneware and earthenware absorb fats, and tin does not; hence it is best to use tin pails for holding the various kinds of fats.

Glass jars are excellent for holding small quantities of such groceries as are not injured by light, as, for example, rice, currants, raisins, etc. Bread, cake, crackers, and ginger-snaps will retain their crispness and freshness if kept in tin receptacles, while if they are kept in stone jars they will become moist.

Taken all in all, tin makes the best receptacles for holding all cereals, dry legumes, sugar, etc. The various receptacles in which these stores are kept should be plainly labeled.

Galvanized iron is used for many articles about the house for which a strong material that will not rust is required. Therefore the ash-barrel, garbage-pail, and refrigerator-pan should be made of galvanized iron.

Galvanized iron.

The refrigerator should be chosen for its simplicity of construction and its sanitary arrangements. When one lives at a great distance from the markets, the refrigerator should be of generous size. In such a case, if the household be large, a small ice-chest for fish is quite desirable.

The refrigerator.

In the list of utensils given, only such articles have been mentioned as would be required by a family living in a moderate way. Of course people who keep a luxurious table will require many things not mentioned here, and, on the other hand, people living in a small way may cut down the list to suit their circumstances. Whether the mode of living is plain or sumptuous, what has been said of the quality of the utensils remains true.

Utensils may be adapted to way of living.

How to arrange the covers of the saucepans is always a problem. There is nothing to hang them by, and one rarely has shelf-room enough for them. I have found that a long rack, such as is placed under the meat when roasting in the oven, is an excellent contrivance for holding these covers. Place it in one corner of the shelf, and slip the edges of the covers between the bars, arranging the covers according to size, the largest at one end, and the smallest at the other. This little convenience economizes both space and time, for a cover can be found or replaced without a moment's delay.

A rack to hold saucepan covers.

VENTILATION

An important duty of the housekeeper in cold weather is to see that the house is properly aired and ventilated.

Every room that is occupied should be thoroughly aired each day. One can keep warmer in a room filled with pure air that has a temperature of 65° than in a room where the temperature is much higher and the air impure. The temperature of the house should not exceed 70°.

Temperature.

The rooms and hallways of the main portion of the house should be thrown together as much as possible, thus keeping an equal temperature throughout the house, and insuring a free circulation of air. If there is a window in the upper hall, or in a room opening off the hall, which may be kept slightly open, it will help keep the air of the house pure. The hot air that comes from the furnace supplies the house, to a certain extent, with fresh air. If the house is heated by steam or hot water, this supply is lacking, and there is greater need of some openings that will admit pure air. A piece of board about two or three inches wide, and as long as the window is broad, may be placed under the lower sash of one or two windows, as, for example, the hall windows. This will give access to fresh air without making a draft, and is a good arrangement for bedroom windows in extremely cold weather.

Method of obtaining a circulation of pure air.

There are patent ventilators that fit under the sash in this manner, which are very satisfactory. They are in the form of a narrow box, one side of which has a number of small openings, the top being covered with fine wire netting. There are slides that may be drawn over this netting when one wishes to exclude all or part of the air. These boxes are placed under the sash, with the openings on the outside.

Screen for excluding dampness.

Many people cannot sleep with the windows open at night or in damp weather. A screen which will admit pure air, and yet keep out the dampness, should be provided for such cases, and may be made in this manner: Fasten *thin* Angora flannel to a frame similar to those used for mosquito nettings. This may be placed in the

window at night, after the sash is raised. In the morning you will find the inside of the screen dry, while the outside will be covered with moisture, showing that dampness was kept out of the room at the same time that fresh air was admitted.

There are a few things that one should keep in mind in order that the ventilation of the house may be done intelligently.

Knowledge necessary for intelligent ventilation.

All gases and moisture expand and rise as they are heated.

All gases and moisture contract and have a tendency to fall as they are chilled.

Some of the gases are at the ordinary temperature lighter than air, while others are heavier. Carbonic-acid gas (carbon dioxid) is about one and one half times as heavy as air.

Definition of pure air.

Remsen says: "Pure air may be defined as air which consists of nitrogen, oxygen, and carbon dioxid in the proportions stated above" (about $\frac{4}{5}$ nitrogen, $\frac{1}{5}$ oxygen, and $\frac{4}{10000}$ carbon dioxid), "together with some water-vapor, ammonia, ozone, and hydrogen dioxid, and nothing of an injurious nature." It is evident from what has been said that there is constant danger of contamination from natural causes. The most common cause of contamination is the breathing of human beings in rooms which are inadequately supplied with air. The breathing process involves the using up of oxygen and the giving off of carbon dioxid and small quantities of organic matter which is undergoing decomposition. If the quantity of oxygen is reduced below a certain limit the air becomes unfit for breathing purposes, and evil effects follow. An ordinary inhalation will not then be sufficient to supply the blood with the oxygen necessary to purify it, and the system will begin to suffer. Headache, drowsiness, and a general sense of discomfort follow. The ill effects of breathing the air of a badly ventilated room occupied by a

Danger of contamination.

number of human beings are, however, due for the most part to the presence of the small quantities of decomposing organic matters which are given off from the lungs with the carbon dioxid and the gases. These act as poisons. They have been thrown off from the lungs because they are unfit for use, and when they are taken back again the normal processes of the body are interfered with. The subject of ventilation has been so thoroughly discussed of late years that great improvement has been made in the arrangements for supplying pure air to dwelling-apartments and audience-halls; but there is still room for improvement. Fortunately, in most buildings there is one source of supply of pure air which is independent of the architect's plans. This is the diffusion of gases through the porous materials of which the buildings are constructed. There is also a good deal of ventilation through the cracks and other apertures which are always to be found in our buildings.

Symptoms which follow the breathing of impure air.

Under some conditions which are not thoroughly understood the air becomes badly contaminated by the decomposition of animal and vegetable matter. Air thus contaminated may cause specific diseases, and some of these are spoken of as being caused by *malaria*, a word which signifies simply bad air. "What it is in this bad air which causes these diseases has not yet been determined; but it seems probable, from researches on other diseases, that there are in the air microscopic germs which have the power to develop in the body and then to cause the symptoms which are referred to as malaria. Germs of one kind and another are undoubtedly present in great variety, and they play important parts in connection with the life and health of man, and also in the destruction of plants and animals in which life has become extinct."

Air when contaminated causes disease.

In ventilating a room the temperature must be taken into

consideration. Whether a room is warm or cold, it is always safe and well to have a window opened at the top. If the room is very warm this is absolutely necessary, because the heated air rises. If the room is cold all the carbon dioxid does not rise; therefore there should be an opening in the lower part of the room for the escape of the gas and the admission of fresh air.

Temperature considered in ventilating.

In sleeping-rooms, which usually are cool, the lower part of a window should be opened, and the top also should be let down. If in summer the windows are provided with a netting, it is a good arrangement to have the entire window covered; then the sash may be raised and lowered at will.

How to ventilate sleeping-rooms.

The kitchen windows should be protected in the same manner. At all seasons of the year, while work is going on in kitchen and laundry, the windows should be let down from the top. By this precaution, not only is the air of these rooms kept pure and sweet, but odors are prevented from getting into other parts of the house.

Ventilation of kitchen.

The entire house should have a thorough airing every morning. In this general airing the health and comfort of the various members of the household must be taken into consideration. No one should be exposed to a draft or chill. There is little danger in this to the healthy person who is moving briskly about, but with the weak and delicate it is another matter. Some rooms, therefore, must be kept warm while the rest of the house is undergoing the airing.

The house should be ventilated every day thoroughly.

The following plan for the daily airing of the house might be observed.

Plan for the daily airing.

1. The first thing in the morning, open the windows in the lower hall, sitting-room, and dining-room. In winter this should be done for a few minutes only.

2. As soon as the sleeping-rooms are vacated, open the windows, take the coverings from the bed, one piece at a

time, and spread them about the room where they will get the full effect of a current of air. Beat the pillows and place them near the windows. Turn the mattress over the foot of the bed, that the air may circulate all around it.

3. The sleeping-rooms should air for at least an hour even in the coldest weather.

4. Open windows in the upper and lower halls, and also open the outside door, if it is safe to do so. After breakfast air the dining-room, which should also have a thorough airing after each meal. Air the other parts of the house as the comfort and convenience of the family will permit.

The advantages of a generous sweep of air throughout the house.

It should be remembered that a great volume of pure air sweeping through the house will in ten minutes remove the impure air more effectually than airing for an hour or more with windows only partly opened and doors closed.

A knowledge of the nature and action of oxygen is essential to an intelligent understanding of the *value* and *necessity* of pure air in our homes and elsewhere. Any good book on chemistry will explain this so clearly that any one even without a knowledge of chemistry can comprehend it readily.

CHAPTER IV

DAILY ROUTINE OF HOUSEHOLD WORK

General directions for sweeping and dusting. To clean matting. How to wash windows. Cleaning copper and brasses. How to clean painted woodwork. Care of window-sashes. Care of dining-room. Care of tableware. Care of kitchen and pantries. Care of the floors. Care of kitchen utensils. Tinware. Woodenware. The tea kettle. Tea-pots and coffee-pots. Care of the refrigerator. The sink. To clean an iron sink. Care of cellar. Household refuse. Care of the plumbing.

The household machinery should be kept in such order that no member of the family shall be uncomfortably conscious of its working. The daily attention to the little duties which, small in themselves, in the aggregate take much time and thought, is what keeps the machinery working smoothly. Here the stitch in time which saves nine is fully demonstrated.

The most important factors.

Method and order are two most important factors in the management of the household. A place for everything, and everything in its place, is a rule the strict observance of which will insure order.

Work should be systematized.

If the work of the household is systematized, each day will see its allotted tasks accomplished and the work of the following day unhampered. It is only in this way that the household machinery can be run without friction.

Each member of the family is a part of the working machinery, and it is important that each one should per-

form his or her part cheerfully and promptly. It is no kindness to child or adult to let him shirk his duties. Life is made up of little things, and they form the character.

Perhaps no two housekeepers follow the same plan in the daily routine of the household work. The mode of living, individual ideas as to the best system, etc., govern every housekeeper.

For the benefit of the inexperienced, a simple outline of the daily program is given as a suggestion. As the method of doing the work is described in separate sections, the general outline is all that is necessary here.

Plan of work to aid inexperienced housekeeper.

1. Make the fires, and air the dining-room and hall.

2. Prepare the breakfast and set the table.

3. Put the bedrooms to air while the family is at breakfast.

4. Remove the breakfast-dishes; put away the food. Sort the dishes and put to soak all dishes and utensils that have had food in them which would be likely to stick.

5. Put dining-room and sitting-room in order, airing them well.

6. Wash the dishes, and put the kitchen and pantries in order. Prepare dishes that require slow cooking, and put them to cook.

7. Make the beds and put sleeping-rooms and bath-room in order.

8. Trim the lamps.

9. Dust halls and stairs; sweep piazzas and sidewalk.

10. Do the special work of the day.

Make the work light on wash-day.

On washing and ironing days make the general work as light and simple as possible, unless a regular laundress is employed.

If each member of the family will do something to lighten the labor of the maids, and the meals are *simple* and *hot*, the work will go on smoothly.

GENERAL DIRECTIONS FOR SWEEPING AND DUSTING

When cleaning is to be done, it will pay to take ample time for doing it well. A house may be made to look clean and orderly when in fact it is quite the reverse.

Take time to clean thoroughly.

A room with a polished floor may be kept perfectly clean all the year round with half the trouble that one has to expend where floors are carpeted. Everything possible should be taken out of a carpeted room, first brushing and dusting each piece thoroughly.

Preparations for sweeping.

Cover the heavy pieces of furniture with cloths kept for this purpose. Then dust the pictures, using a soft feather duster for the frames, and a coarse brush for the backs. Cover all the pictures, mirrors, clocks, etc., with pieces of coarse unbleached cotton. (It will be a great convenience if a number of these cloths are kept for covering all the furniture and ornaments that cannot easily be moved.) Close the doors and open the windows.

Method of sweeping.

It is sometimes a good plan to scatter damp paper or damp bran over a carpet that has become more than ordinarily dusty; then begin to sweep, holding the broom almost perpendicular and taking short strokes. Sweep in one general direction, then take up the dirt.

Brush the dust from every part of the frames and ledges of windows and doors, using a medium-sized brush, such as a paint-brush, for the moldings and corners, and finish with a soft cloth. Cheese-cloth makes a good duster.

Brushing walls and ceiling.

Cover the broom with a clean piece of flannel or cotton flannel, and brush the ceiling and walls, using a downward stroke on the walls. Brush the baseboards. Next, brush the edges and corners of the carpet with a short corn-broom, and sweep the carpet a second time.

While the dust is settling, wash the windows. When the

windows are finished, take the cloths off the furniture and pictures, and dust the room. Wipe spots from the paint and woodwork. The carpet should then be wiped over with a clean cloth wrung out of ammonia and water, using two tablespoonfuls of ammonia to four quarts of tepid water. Rinse the cloth frequently in this water.

Windows, paint, and woodwork.

Final treatment of carpet.

Put up the hangings and lay the rugs in place; bring back the furniture and ornaments. If the woodwork of any of the furniture needs polishing or oiling, now is the time to do it.

If there is a fireplace in the room, all the brass or steel about it should be removed before the room is swept. The grate and fireplace should then be cleaned, and the hearth properly brushed. It should be washed after the carpet is swept. The brass or steel must be polished in the kitchen or laundry before it is replaced.

Care of fireplace and brasses.

If there are registers in the floor, lift them before you begin to sweep. Have a large paper spread on the carpet, and brush the registers on this. Wipe the hot-air pipe to remove all dust. Lay a newspaper over the opening, and place the registers, upside down, over it. The paper is to be removed when the sweeping is finished and the registers are put in place.

Care of registers.

Rugs and Draperies.—The draperies which were taken down when the room was being prepared for sweeping should be well shaken in the open air, and, if possible, hung on lines out of doors. Brush heavy material, like velvet, plush, brocade, etc.

The rugs should be laid face downward on the grass, or on a smooth wooden surface, and beaten with a ratan. Then they must be turned face upward and brushed. Hang them on the line to air. If there is no grass or plain surface on which to beat the rugs, hang them on the line at once, shake out the loose dust, and beat with the ratan.

It is a bad habit to hold the rug at one end and shake it. The weight of the rug loosens the threads at the upper end; hence the raveling near the borders.

Furniture.—Upholstered furniture should be dusted with a brush, and wiped with an old silk duster. The woodwork must be rubbed with a soft cloth. If there is carving on the woodwork, it should be dusted with a brush.

When the woodwork of the furniture requires polishing, wipe it with a soft sponge, or cloth, which has been wrung out of tepid water or warm milk. Wipe dry, and then polish with encaustic No. 1, or simply oil with the turpentine and oil. Apply the polish with a soft cloth, using a circular motion. The cloth should be only slightly moistened with the mixture. Polish with a soft cloth, rubbing with the grain of the wood. All stains must be removed from the wood before it is polished.

Leather Furniture.—Dust the furniture carefully, and wash the leather with a soft cloth wrung out of hot milk, rubbing until dry; then polish with encaustic No. 1, putting the polish on lightly. Polish with a soft cloth; if the leather is dark, it may be polished with oil and turpentine.

Marble, Tiles, etc.—Marble is easily destroyed, and most of the injuries it receives are difficult to repair.

Acids dissolve marble readily; the stronger the acid, the more rapid its action. The smooth, fine finish given to marble is not only for beauty, but also for protection. If this finish is destroyed, the rough surface is more easily soiled and stained. Even the mildest acid will remove the polish. A piece of lemon left on a basin, mantel-shelf, or table for even a few moments will roughen the surface of the marble.

Action of acids on marble.

As all acids are neutralized by an alkali, the latter should be immediately poured on the marble when an acid has been spilled on it. There are so many alkalis at hand in nearly every household—ammonia, soda,

To neutralize acids spilled on marble.

borax, for example—that this is not difficult to do. If the acid has remained long enough on the marble to dissolve the surface, the finish may be restored in a measure by rubbing the rough spot with pumice-stone and water. A generous bed of the pumice-stone should be spread on the injured place; this should then be wet with water and rubbed with a large, flat stone. It takes a great deal of pressure and much rubbing to get a smooth surface again. The work might be done from time to time, say for twenty minutes or half an hour every day, until the polish returns.

Difficulty of removing stains.

Stains on marble are often difficult to remedy, because the agent used to remove the stain might injure the marble. Acids must, of course, be avoided, but alkalis may be used with safety.

Oil- or grease-spots, when of recent occurrence, may be removed by absorption and neutralization. Fullers' earth and French chalk are two of the best agents for absorbing grease. Caustic soda or lye will saponify it and so neutralize it. It is often expedient to combine these two methods.

Removing oil or grease with fullers' earth, soda, etc.

If grease is spilled on marble, make a strong, hot solution of sal-soda, and add enough fullers' earth to make a thin paste; spread this on the spot, and let it remain for twenty-four hours. If the stain has not fully disappeared at the end of that time, repeat the application.

Wood-ashes may also be applied to grease-spots with success. Boil water and wood-ashes together for half an hour, and add enough whiting to make a thick paste. Spread this on the stain as directed for fullers' earth.

The ordinary care of marble is simple enough. It should be washed with a soft cloth and soap and water. If it is very much soiled, it may be cleaned with any one of the sand soaps or pumice-stone and soap. If the marble lacks luster after this treatment, polish it with encaustic No. 1 or No. 2.

Tiles are cleaned and polished in the same manner.

TO CLEAN MATTING

In the care of matting, it must be remembered that the less water used on it the better, and that all alkalis and soaps tend to discolor it.

Substances injurious to matting.

Have a care that nothing that will soil the matting is dropped or spilled on it.

Sweep the matting with a soft brush, and then go over it with a damp cloth to remove all dust.

If there are soiled spots, try to remove them by rubbing with a cloth wrung out of hot water.

To remove grease or oil from matting.

If grease or oil has been spilled, make a thin paste with fullers' earth and cold water, and spread thickly on the spot. When this dries lay a paper over it, and let it stand two or three days. Brush off the dry earth, and the stain will have disappeared.

To remove moisture from matting.

Should water be spilled on a matting, wipe it as dry as possible, and let the windows stand open until the matting is dry; or, if the weather is too cold or damp for this, dry the matting by applying heat. Lay a dry cloth over the wet place, and go over it with a hot flat-iron until all moisture is removed.

HOW TO WASH WINDOWS

Remove all dust from the windows, both inside and outside. If the woodwork requires cleaning, do this before the glass is washed. Use a wooden skewer and a cloth to remove dust from corners and grooves.

Materials for the washing of windows.

The glass may be washed with clear water, water in which has been put a little liquid ammonia, soda, or soap, or it may be cleaned, like paint, with whiting. The essential thing is to get a clean, perfectly polished glass.

Have plenty of clean, soft cloths and some soft paper; crumpled newspapers answer very well. Have a pail of tepid water. Dip the washing-cloth in this and then squeeze almost dry. Rub the glass with the damp cloth, rinsing it frequently. After all the dirt has been removed in this manner, rub dry with a clean, soft cloth, and then polish with soft paper. Be careful to get all the corners clean.

If the glass is cleaned with whiting, make a thin cream of water and whiting. Dip a clean cloth in this, and polish the glass as you would silver. Rub off the whiting with soft paper, and polish with clean soft paper.

The whiting may be wet with dilute alcohol or household ammonia. This mixture cleans the glass quickly.

Secret of success in cleaning windows. The secret of cleaning windows satisfactorily is to have the cloths clean, to use plenty of them, and not to use water so freely that it drips from pane or sash.

CLEANING COPPER AND BRASSES

There are so many excellent preparations on the market for cleaning copper and brasses that it is not necessary to make the polishes at home for this purpose. At the same time, it is well to know how various substances affect these metals, and why we use them.

Effects of acids on copper and brass. Acids clean copper and brasses readily; but unless all traces of them are immediately removed, the metal will tarnish quickly. Whenever the simple acids, or acids and salt, are used, they must be washed off at once with pure water. If the articles so cleaned are boilers, andirons, ornaments, etc., the cleaning should be followed by a rubbing with rottenstone or tripoli and oil. After a thorough treatment of this kind, brasses and copper articles will remain untarnished for a long time. If a cleaning preparation contains an acid,—

and nearly all the preparations on the market do,—the cleaning should be followed by an application of whiting, which will neutralize the acid and preserve the surface from tarnishing.

Cleaning preparations that contain naphtha or an acid accomplish the work much more quickly than when oil and rottenstone only are used.

Color obtained by different preparations.

Brasses cleaned with oil and rottenstone alone, or with tripoli, will have a soft, rich yellow tone. When acids and naphtha are used, the color is whiter and, of course, less rich.

Selection of cleaning substance.

Bearing all these points in mind, one may select the cleaning substance that will give the result aimed at, be that the durability of the work, the quickness with which it may be accomplished, or the color desired.

Cleaning with oxalic acid and salt.

To Clean with an Acid and Salt.—Wash thoroughly the article which is to be cleaned. Mix common salt and oxalic acid or vinegar in a saucer. Dip a soft cloth in this, and rub the surface until all tarnish is removed. Wash the article in plenty of water, and then wipe perfectly dry. This method is frequently used in cleaning cooking utensils, in which case the greatest care must be taken to wash the saucepan, etc., thoroughly after the treatment.

To clean with sal-soda, an acid, etc.

Brasses or copper that are very much tarnished may be washed in a solution of sal-soda to remove all grease, then rubbed with acid, either oxalic acid, lemon-juice, or strong vinegar, and washed thoroughly, wiping dry. Polish with rottenstone or tripoli and sweet-oil, using a woolen cloth, and rubbing hard. Wipe off the oil and scouring mixture, and go over the surface with a dry flannel and dry tripoli or rottenstone; finish with a soft, clean cloth. If the article has not a thick coat of tarnish, the washing with soda or acid may be omitted; but it is important that the surface be cleaned from all grease.

The above method should be followed when any of the cleaning preparations found in the market are employed, except that whiting should be substituted for tripoli, oil, or rottenstone in the final polishing.

Brasses and copper articles retain their brightness, after they have been properly cleaned, a long time when kept in a dry atmosphere; but when exposed to dampness they tarnish quickly.

HOW TO CLEAN PAINTED WOODWORK

Painted and varnished surfaces should be treated with great consideration. It is possible in a few minutes to do an amount of damage that cannot be repaired in days. The careless use of chemicals on these finishes causes the greater part of the trouble. If we can but fix in our minds the effect some chemicals have on certain materials, it will help us to use them more intelligently.

Chemicals should be used with care.

Paint is softened by wet alkalis; when the solution is strong enough it dissolves the paint.

The alkalis most commonly used in the household are ammonia, sal-soda, potash, and borax. The most caustic of these alkalis are potash and sal-soda; the least caustic is borax. If we take a board which has been painted or varnished, and put a few drops each of a solution of soda, potash, ammonia, and borax on different parts, we can see how each affects the paint; the stronger the solution of any of them, of course the more quickly it will soften the paint. The same kind of a test might be made with a varnished surface.

How to test the effects of alkalis.

The effect, if oil is added to alkaline solution, is to neutralise.

If we now repeat the experiment on new spots, and almost as soon as the liquids have been dropped on the painted or varnished surface we add a few drops of oil, stirring it well, we will find that the paint or varnish is only slightly dam-

aged. The oil neutralized the power of the alkalis, and the injury done to the paint or varnish was the work of the few moments before the oil was added. If, however, the oil was applied in too small a quantity to wholly neutralize the alkali, the latter would continue its destructive work, but very slowly and feebly. If a large quantity of the oil is added *instantly* when the alkaline solution is dropped on the board, the effect upon the finish will be scarcely perceptible. We have learned from this simple experiment:

1. That paints and varnishes may be dissolved by the alkalis in common use in the household, and that the stronger the solution, the more rapidly it acts.

Lessons to be learned from these experiments.

2. That the destructive action of the alkali may be arrested by the application of any oily substance.

If there is not enough oil to wholly neutralize the alkali, the action will go on feebly; but if there is enough oil, or an excess of it, all destructive action is arrested.

In case of an alkaline mixture being spilled on painted or varnished surface add *oil instantly.*

Putting this knowledge to a practical use, we have been taught that no strong alkali should be put on painted or varnished surfaces; that no strong caustic soaps should be used on paint or varnish; that in case of accident where an alkali is spilled on a painted or varnished surface, some sort of oil or fat should be *instantly* poured on the spot. Generally the oil nearest at hand is salad-oil, and this is such a pure oil that it is excellent for such a purpose.

Avoid use of strong soap or alkalis.

In cleaning painted or varnished surfaces we should keep in mind what we have learned in these experiments, and avoid the use of alkalis and strong soaps.

When the paint is to be cleaned, have the room thoroughly swept and dusted, walls, ceiling, grooves, and ledges. Use a painter's brush to remove the dust from the grooves and

corners. Mix some whiting and cold water to the consistency of thick cream. Three woolen cloths and some soft white cotton cloths will be necessary. There should also be two pails, each half filled with hot water, and a small wooden skewer such as butchers use. Put a woolen cloth in each pail of water, and keep the third one dry. Press nearly all the water from one of the cloths, dip it in the whiting mixture, and begin cleaning the paint. Rub hard, with an upward and downward stroke, when plain walls are being cleaned; in woodwork, follow the slight grain left by the painter's brush. Next, carefully wash off all the whiting, using the water and cloth in the second pail; then wring the cloth dry, and wipe the surface with this. Now rub *dry* with the dry woolen or cotton cloth. This final rubbing gives a smooth finish to the paint that not only improves its appearance, but tends to keep it clean much longer than if the surface were left half dried. All the grooves and corners should be cleaned with a bit of the cloth on the point of the wooden skewer.

How to clean paint with whiting.

Begin at the top and work downward, washing a space about a yard square. Never use water enough to have it run on the wall in little streams; this leaves a streaked surface.

Avoid using too much water and letting it form streaks.

If the paint is very smoky or oily, a tablespoonful of household ammonia may be added to each gallon of water.

Should soap be preferred to the whiting, make suds with it; but do not rub soap on the cloth, except in cases where the suds will not remove the dirt.

Enamel finishes require different treatment from ordinary paint. They are finished, like fine varnishes, by being rubbed down with water and tripoli.

Treatment of enamel finishes.

Wipe off all the dust, and then wipe with a clean woolen cloth wrung as dry as possible in hot water. Rub dry with a second woolen or cotton cloth. The

dry rubbing is important, as it gives the surface brilliancy. Should there be soiled places which the damp cloth will not clean, put a little wet powdered tripoli on a small piece of flannel, and rub gently until the stain has entirely disappeared. Be careful not to use so much pressure that the powder will cut through the varnish. Polish with the dry cloth. Should you not have the tripoli, powdered pumice-stone will answer.

Care of Natural-Wood Finish.—To have the interior of the house finished in the natural wood is a great boon to the housekeeper, provided she takes proper care of it. One should avoid using water on these woods as much as possible. Oil and turpentine or alcohol is the best substance with which to treat them, as it preserves the finish and the wood. When any place on the wood becomes very much soiled, it may be cleaned by rubbing with a woolen cloth wet with turpentine or kerosene. The turpentine removes the gloss, and should be followed with oil. A little tripoli can be moistened with oil and the spot cleaned with this. Once a year go over the woodwork with a mixture of paraffin-oil and turpentine, using equal parts of the oil and turpentine, unless the finish looks dry and cracked, in which case rub in the pure oil. On dark wood, when the finish has this dry, cracked, or faded look, the boiled linseed-oil is better than the paraffin-oil. The oil should be thoroughly rubbed in, and if one application does not bring back the color and finish, apply about once in two weeks until the surface is restored. It is only when the finished surface is exposed to heat, sun, or moisture that these conditions are likely to appear, as, for example, the woodwork near steam-pipes, registers, windows, sinks, or in bath-rooms, etc. The frequent application of oil, well rubbed in, will keep such exposed places in good condition. Outside doors should be oiled with pure boiled linseed-oil several times each year.

To restore dry or cracked surfaces.

Care of outside doors.

When the regular yearly cleaning is being done, have the woodwork of the room brushed and wiped free from every particle of dust. Moisten a woolen cloth with the mixture of oil and turpentine, and rub the wood finish. Follow this with a dry woolen cloth, rubbing hard to give a polish.

Yearly polishing of woodwork.

If the odor of turpentine is objectionable, and expense is not a serious question, wood-alcohol may be substituted for the turpentine.

If there are any bruised or scratched places on the woodwork, restore the color and finish before oiling. (See "To Restore Color and Finish to Woods.")

CARE OF WINDOW-SASHES

Window-sashes that are finished in oil or varnish require special care. They are often exposed to the heat of the sun and to moisture caused by steam condensing on the cold glass or the melting of frost in winter, etc. The heat of the sun draws the oil from the finish, and various other conditions combine to destroy the finish on this part of the woodwork sooner than that in any other part of the room. If the wood is kept well oiled all this damage can be avoided.

Injury to window-sashes caused by heat and moisture.

Have a little boiled linseed-oil in a shallow cup. Make a small soft pad, and dip it in the oil. Rub this on the sash, being careful not to get any on the glass, as it takes time to remove it. Be generous to the part where the top and bottom sashes meet, as this is the place that receives the greatest proportion of sun and moisture. This oiling might be done once a month.

Treatment of window-sashes.

When the sashes have been neglected and they have become rough and dry, rub them smooth with sandpaper, oil with boiled linseed-oil, and then put on a finish as directed in "To Restore Color and Finish to Woods."

CARE OF DINING-ROOM

The dining-room should be kept in perfect order, and it should be clean and free from odors. There are reasons for and against a carpet in this room. Woolen carpets absorb odors, and, if anything happens to be spilled on them, are more difficult to clean than is the bare floor, or a rug which may be carried out and aired with ease. On the other hand, noiseless service is more difficult on the polished floor, and there is danger of accidents from slipping. Two or three breadths of fine Japanese matting, sewed together to make a square, and the ends bound, make a very satisfactory rug for the center of the dining-room. Whether the floor is carpeted or polished, it should be brushed each morning. The room must be thoroughly aired and dusted each day. Once a week there should be a thorough cleaning of this room as directed in "General Rule for Cleaning a Room." In this general cleaning the closets, sideboards, shelves, etc., should have special care. The table should be rubbed free from spots, and be oiled or waxed, as the case may be. All spots on wood must be wiped off and the windows washed.

Objection to carpet in dining-room.

When dining-room should be aired and cleaned.

In addition to the thorough airing in the morning, the dining-room should be aired for a short time after each meal, even in the coldest weather.

CARE OF TABLEWARE

Silver.—If washed in plenty of soap and hot water and rubbed dry with clean, soft towels each time it is used, the silver will not often require cleaning.

To clean the silver, first wash it in hot suds, and wipe it. Cover a table or a large tray with thick paper. Have fine

French whiting which has been sifted. Put a portion of this whiting in a saucer, and wet it with diluted alcohol or ammonia. With a soft cloth apply this mixture and rub on the silver. Spread on the paper to dry. When all is finished rub the whiting off the silver with a soft, clean cloth; then polish with chamois. A soft brush will be required for grooves and chased work.

Method of cleaning.

This cleaning with whiting should not be necessary oftener than once a month, except where an article is tarnished by eggs or some such substance, in which case clean with whiting. If the silver tarnishes quickly there must be some gases in the house; therefore gas-pipes and drain-pipes should be inspected.

Cause of tarnishing.

It must be remembered that constant rubbing wears away the silver, and that any substance that will clean a tarnished metal without much friction will probably attack the metal also.

Injurious treatment of silver.

Silver should be kept by itself; hard substances, like steel knives, scratch it.

The handles of the knives should not be allowed to go into the dish-pan; they should be held in the dry left hand while the blades are washed with a cloth in the right hand.

Care of ivory-handled knives.

Spots may be removed and the polished surface restored to ivory handles by rubbing with powdered pumice-stone and water. This means a good deal of hard rubbing, if done by hand.

Glass.—There is a great diversity of opinion as to the best methods of washing glass. Cold water answers very well for articles that are not much soiled and have had no oily substance near them. Ammonia or soda in the water cleanses the glass readily and gives a luster. Soapy water also cleans the glass easily. When glass is washed in cold water it should drain until nearly dry. It must then be polished with a clean, soft towel. It is more difficult to wash in cold water, and it takes longer to polish the glass.

Glass that has been washed in warm water with either soda, ammonia, or soap should be wiped at once.

A soft brush is required for cleaning cut glass. A clean towel should be spread on a tray, and each piece, as it is wiped, should be placed on this.

Care of cut glass.

This precaution is particularly necessary with dishes that are deeply cut at the bottom. When placed on polished wood the moisture produces a white mark. Fine sawdust is very good for cut glass; it absorbs the moisture from those parts that cannot be reached with the cloth. After wiping the glass, bury it in a bed of sawdust, and let it remain half an hour or more. When the glass is removed from the sawdust, brush it with a soft brush, and polish with a soft cloth.

Use of sawdust for cut glass.

A word of caution must be said here. The sawdust should come from a non-resinous wood, such as box or basswood; it must be fine, and free from any hard substance. If sawdust from pine or any resinous wood is used, the resin will stick to the glass, and it will be found most difficult to remove. The sawdust should be spread out to dry after having been used; in this way it may be employed a number of times.

One thing must always be remembered: to scratch glass is to weaken that part, so that a little extra heat or cold, or a slight jar, will cause a break at that point. A grain of sand at the bottom of the dish-pan, or on the dish-cloth, may make this little scratch which will split your beautiful dish in twain.

Danger of scratches on glass.

China.—The dishes should be scraped clean, and then rinsed off with clear water. Wash them in soapy water, rinse in clear hot water, and drain and wipe dry.

Do not place one dish upon another as they are wiped. Spread them out to cool off, then put them together. Piling them together while warm is apt to crack the glaze.

Must not be placed one on top of another.

Put only a few dishes in the pan at a time. Do not use much soap on gilt china.

Use very little soap on gilt china.

Before beginning to wash dishes, have them all sorted and put in groups, keeping those of the same kind together.

Wash, rinse, and wipe one group before beginning another.

In wiping dishes the hands should not come in contact with the dish. Hold the dish in the left hand, having the towel between hand and dish. Never wipe with a towel that has become wet.

How dish and towel should be held.

Glass, silver, and china should present a brilliant surface when the wiping is finished. This can only be done by washing them very clean, and wiping thoroughly with a soft, clean towel.

The towels should be washed, rinsed, and hung out to dry after the dishes are finished.

Pewter, Britannia, and block-tinware are often used on the table in the form of tea- and coffee-pots, dish-covers, and chafing-dishes. These can be polished with powdered rottenstone and oil, or oil and whiting, or in the same way that silver is polished.

Care of pewter, Britannia, and block-tinware.

Wash the article first in hot soap and water, and wipe dry. Dampen a cloth with sweet-oil, and rub it over the article to be polished. Put rottenstone or whiting on a piece of soft, dry flannel, and rub over the oiled surface. Then polish with dry whiting and chamois.

Steel knives are polished with soft soap, Bristol brick, and a large cork.

Wash the knives in soap and water, and wipe dry. Have a smooth board on which rests the blade of the knife perfectly flat. Dip the cork in the soap, then in the powdered brick, and rub the steel until all stains are removed. Then polish off with dry powdered brick, and wipe with a soft cloth.

Method of ofpolishing steel knives.

To keep steel from rusting, cover with sweet-oil or mutton tallow, and wrap in soft paper.

To remove rust. To remove rust, put oil and quicklime on the rusted article. After several days rub with oil and rottenstone or Bristol brick.

CARE OF KITCHEN AND PANTRIES

Ventilation, light, and finish. The kitchen and pantries should be well lighted and aired. Nothing that will hold odors, such as woolen carpets or draperies, should form a part of the furnishing of any of these rooms. The woodwork should be of natural wood, varnished or oiled, and the walls should be painted or covered with a paper that may be washed.

Floors of kitchen and pantries. The floors in this part of the house are something of a problem. White boards are exceedingly attractive when in good condition, but they require infinite care. A hard-wood floor, properly oiled, is quite satisfactory; so is a well-painted and -varnished floor. Oil-cloth makes a clean and pleasing covering, and one that is easily kept clean. I should never advise its use, however, as it is cold for the feet. Linoleum is a most satisfactory floor-covering. It may be cleaned with ease, it is soft, warm, and elastic, and wears well.

Enameled cloth. Tables and shelves, like the floors, when in white wood and kept in good condition are a delight to the eye; but to maintain them in this state means much work. Painted or varnished shelves are clean, and may be kept so with little trouble. A covering of white enameled cloth on the shelves and kitchen tables looks particularly well, and the work of taking care of it is very light. These coverings should be laid on smoothly and held in place with small tacks. Heat destroys the enamel, therefore hot dishes must not be placed directly on these covers.

The daily care of kitchen and pantries consists of sweeping and dusting, wiping or washing of shelves, tables, and floors, and the cleaning of the sink and range, etc.

Daily care of kitchen and pantries.

Strong soaps and alkalis should not be used on paint or varnishes. They soften and remove the dirt quickly, but they also soften and remove the paint and varnish.

Care of varnished or oiled woodwork.

The varnished or oiled woodwork in the kitchen, pantries, back halls, etc., may be kept clean by wiping it with a flannel cloth wrung out of hot water, and then rubbing smooth and dry with a dry cloth. Finger-marks may be removed by rubbing them with wet whiting; the whiting should then be wiped off and the surface wiped dry. Painted walls may be kept clean in the same way.

CARE OF THE FLOORS

Oiled floors.

A hard-wood floor, if properly oiled, is quite satisfactory; but if it is badly done it is a constant source of annoyance. The oiling of the floors in the back part of the house, as a general rule, must be done in the evening, after the work of the day is finished. This oiling is sometimes done by a member of the family, but quite as often a painter is employed who is accustomed to that kind of work. Whoever does the oiling, there are three things upon which success largely depends: First, there should be no floating dust in the room, and the floor must be *absolutely* clean. Second, the oil must be of the right kind and in the proper condition. Third, the oil must be rubbed into the boards thoroughly, so as to leave a perfectly smooth surface.

Boiled linseed-oil.

Boiled linseed-oil dries more quickly than the raw oil. It is well to add a little turpentine, as it will make the oil less sticky. It must be remembered that with the oiled floor, as with all surfaces, the more

highly polished it is, the longer it will keep clean. Therefore it should be rubbed with a dry flannel once or twice a week.

Daily care of oiled floors.

The daily care of the oiled floor consists of sweeping it with a hair brush, and, if there are any soiled spots, of wiping them off with a flannel cloth wrung out of hot water. If this does not remove all the dirt, a little soap may be rubbed on the cloth.

Treatment of floor once a week.

Once a week wipe the floor with a damp cloth, using soap when it is necessary; wipe very dry, and then go all over the floor with a cloth made damp with kerosene or boiled oil and turpentine. This should be rubbed in thoroughly, and the floor should not be walked on, if it is possible to avoid it, for an hour or more. The windows should be left open, that the odor of the oil may pass off. Cover an old brush with a woolen cloth, and rub the floor; it will take a fine polish.

See "Care of Polished Floors," for method of oiling floors.

Painted or varnished floors.

The painted or varnished floors in the back part of the house are usually ruined with soap and water and scrubbing-brushes. Strong soaps, soda or ammonia, and a scrubbing-brush, in the hands of a vigorous woman, will remove the greater part of the paint or varnish from a floor in a short time. As little water, soap, or alkalis as possible should be used on these surfaces.

Proper treatment of painted or varnished floors.

Sweep the floor, and wipe off the dust with a damp cloth. If this will not remove all the dirt, use a woolen cloth wrung out of hot water. If the spot is very dirty it may be necessary to put a little soap on the cloth. Rub hard with the woolen cloth, but never use a scrubbing-brush. Once a week, after having swept and wiped the floor clean, go over it with a cloth dampened with one part boiled oil and one part turpentine, or kerosene may be used instead. The work of caring for a floor in this manner is much less than when a

great deal of water and soap is used; and, moreover, the floor is in a sanitary condition, because the boards are *dry* and clean.

On a farm where milk is abundant the floor may be washed with hot milk and water; it must be wiped perfectly dry after this treatment.

Linoleum. Oil-cloth and linoleum may be treated in the same manner as a painted or varnished floor.

White board floors and tables. For cleaning white boards, whether they are in floors or tables, there is nothing better than fine sand and water that is warm but not hot. The boards should be scoured with sand and water, then washed with clear warm water, and thoroughly dried. The rubbing should always be in the direction of the grain of the wood. This treatment will keep boards beautifully white. Great care must be taken to wash every particle of sand from the tables, and to see that none gets into the sink or dish-pan. A scratch from a grain of sand might be the trifle that would cause the breakage of a piece of fine glass.

Removal of grease-spots. Grease-spots on tables and floors may be treated in several ways. (See "Stains on Wood.")

CARE OF KITCHEN UTENSILS

Importance of thoroughness in care of kitchen utensils. On the proper care of the kitchen utensils depends to a great degree the healthfulness and success of the cooked food. No matter how many utensils there are, or how perfect they may be, unless they are kept in good condition they will not do satisfactory work. A saucepan from which the enamel has been chipped, or which has been burned black and rough, will spoil the flavor and appearance of any preparation cooked in it; a tin dish which has rusted, or from which the tin has been scratched, will also ruin the flavor and appearance of food, and so it is through the whole category.

Systematic thoroughness, then, in the care of the kitchen utensils is absolutely necessary for their preservation and for perfection in cooking. With the proper appliances this is not a difficult task.

Plenty of hot water, soap, and towels, and willing hands are all that are needed to keep these articles in good order. Soiled utensils should not be left standing for the particles of food to harden on them; nor should a knife or spoon be used to scrape off these adhering particles; such treatment soon destroys the enamel or plate. If a substance clings stubbornly to a dish or stew-pan, use the dish-cloth of wire rings. This cleans quickly, without scratching or otherwise injuring the surface.

Method of cleaning utensils.

As soon as each dish or stew-pan is emptied of its contents it should be filled with water; when dish-washing time comes, it will be found that all clinging particles are thoroughly soaked and may be rinsed off before the dishes are put into the pan of hot, soapy water.

There should be no stint in towels, soap, and hot water. Towels for silver, glass, and china should be of linen. A loosely woven cheap linen crash makes the best toweling for the cooking utensils. A closely woven, stiff towel is most difficult to wash, and it must be half worn before it will wipe articles dry. There should be long cotton and linen towels in reach for handling hot pots and pans. A good length for these towels is forty-two inches. Then, there should be soft towels for the hands, a mixture of cotton and linen being better than all linen for this purpose. Two linen dish-cloths,—which, by the way, should not be used after they have become so worn that they will leave lint on the dishes, —a wire dish-cloth, and a bunch of wooden skewers are indispensable.

Towels and dish-cloths.

All kitchen utensils should be washed and wiped as carefully as the dining-room china.

Here is a good rule for the daily care of utensils. We will take it for granted that pots, pans, bowls, etc., were put to soak as soon as they were emptied of their contents. Rinse off all particles of food that cling to the utensils. If there are spots where the substance has stuck or burned on, rub with the wire dish-cloth until all traces are removed; never scrape with a knife or spoon. When all the dishes are cleaned in this way, fill a dish-pan half full of hot water, well soaped; nearly fill a second pan with clear hot water. Begin by washing the earthenware in the hot suds, rinse in the hot water, drain, and then wipe with clean, dry towels. Follow this method with the tins and granite-ware, then with the ironware, changing the waters, of course, as they become soiled or cool. Wash the outside and bottom of the utensils as carefully as the inside.

General rule for the care of kitchen utensils.

Any utensil in which frying has been done must be wiped with soft newspaper to remove all the grease before it is put in the water for washing. Use plenty of soap and very hot water when washing greasy cooking utensils. If frying-pans or kettles become rough and dark they can be made smooth and bright by scouring with soap and wood-ashes.

Tin and iron should be wiped while still hot.

All grooves in cooking utensils may be cleaned with a wooden skewer.

In thinking over the care of the kitchen, pantries, utensils, etc., it seems almost more important to speak of the things one should not do, rather than the things one should do; for a great deal of damage can be done in a short time, and the task of repairing it is discouraging and sometimes almost hopeless.

Ironware improves with use.

New iron is one of the most difficult materials one has to deal with in kitchen utensils; as it grows older, and the surface becomes more smooth with use and proper treatment, it is comparatively easy to keep it in good condition.

It should be borne in mind that acids tend to cause rust on iron, while soda and fats make the surface smooth and prevent rust. Moisture also causes rust.

Effect of acids, soda, and fats.

The inside of new iron utensils should be coated with fresh mutton tallow and allowed to stand a few days. At the end of that time they should be heated gradually until the fat melts, and then washed in hot water in which washing-soda has been dissolved. One tablespoonful of the soda should be used with every two quarts of water. A mop should be used for this washing, as the strong solution of soda would injure the hands. Rinse the utensils in hot water, and wipe them *dry* with a clean, dry, coarse towel, rubbing very hard. If food or cloths are darkened by the utensil after this treatment, it should be scoured with soap and sand, after which it will give very little, if any, trouble.

Treatment of new iron utensils.

The treatment of ironware, after this, is very simple. As soon as the utensil has been emptied, when food has been cooked in it, fill it with water, and let it rest on the back of the range until you are ready to wash it. All particles of food adhering to it will be softened by this means, and may be washed off before the utensil is put in the dish-pan. Have hot soapy water in readiness; put one utensil at a time *into* the pan, and wash the inside and outside with equal care. When all the saucepans, kettles, etc., have been washed in this manner, rinse them in hot water, drain them, and wipe first with the dish-cloth, and then with a *dry* crash towel, rubbing hard.

This is the only treatment that will insure a perfect condition of iron- or steelware. Scouring the inside of iron or steel articles with any kind of sand soap or mineral soap makes the surface smooth and bright. Frying-pans, griddles, omelet-pans, etc., may be kept in perfect condition by this means.

TINWARE

Wash tinware in *hot* soapy water, rinse it in clear hot water, and wipe dry with a dry dish-towel. Articles made of tin should not be put on the range to dry, as they are apt to be darkened or melted by this treatment. When they need cleaning, wash them thoroughly in strong soap-suds, and clean them with whiting or sand soap; then wash, rinse, and wipe dry. Sand should never be used for scouring tins, as it cuts through the soft metal, leaving bare tiny lines of iron that soon make their presence known by fine streaks of rust.

Scouring of tins.

There are several cleaning-materials that are free from hard, cutting particles which may be safely used on tins, enamels, etc., among others being sifted whiting, kaolin, sifted wood-ashes, that may be taken from the flues under the oven or from the dust-flue in the furnace. There is a soap on the market, which is largely composed of kaolin, that is excellent for cleaning paint, tins, windows, etc., since it removes all dirt without scratching the surface.

WOODENWARE

Wash all woodenware in hot soapy water, rinse in clear hot water, and wipe with a dry towel. Woodenware may be put in the sun to dry, but never near the fire, as great dry heat cracks the wood. Pastry-boards, meat-bowls, and other bowls may be scoured as directed for white tables.

Wash woodenware with soda to remove odor.

Wooden bowls in which fat meats and vegetables have been chopped sometimes retain the flavor and odor of the substance that has been in them. These may be removed by soaking the bowl in hot soda-water, using one teaspoonful of soda to one quart of water.

Utensils in which fish or other food that imparts an odor or flavor has been cooked should be boiled for a short time in soda-water. This can be done by putting a quart of water and a small piece of washing-soda, or a teaspoonful of baking-soda, into the saucepan or kettle, and placing it on the range where the water will boil.

To deodorize cooking utensils.

Wood-ashes are excellent for cleaning and deodorizing iron and tin utensils. Put a gill of wood-ashes and a pint of water in the stew-pan or kettle, and place it on the fire where it will simmer for half an hour. Let the mixture cool partly, then scour the utensil with it, using a coarse cloth, or a coil of grass or hay if one lives in the country and has it at hand.

THE TEA-KETTLE

The tea-kettle is one of the problems of the kitchen. It is difficult to keep it free from rust. If it could always be emptied and wiped dry when not needed, this might be prevented; but hot water is constantly in demand, and the tea-kettle seems to be the place where it should be found.

When water cools slowly in a covered vessel, globules of steam gather on the cover, sides, and bottom. Tiny spots of rust will soon appear, which grow as time goes on, until finally the whole interior surface is covered. This is what happens in the tea-kettle from day to day. The remedy is to empty the kettle while it is hot, rinse it out, and wipe it dry.

Cause of rust.

In any case, the tea-kettle should be washed out every day; for even clean water will be found to leave a deposit. This washing out had better be done in the evening, when the work for the day is over; it will insure thorough drying, and will do a great deal toward preserving the tea-kettle in good condition. There are tea-kettles that are lined with white enamel, which can easily be kept in good condition.

Care of the tea-kettle.

TEA-POTS AND COFFEE-POTS

Tea-pots and coffee-pots require the most thorough cleaning daily. They should be freed from grounds or leaves, rinsed in cold water, and washed with clear hot water. They should then be scalded with boiling water, wiped dry, and placed where they may be thoroughly aired.

CARE OF THE REFRIGERATOR

Situation. The refrigerator is nearly always on the same floor with the kitchen. It should be placed where it may be well lighted and aired, and on no consideration should the waste-pipe of the refrigerator be connected with the drain-pipe of the house. A pan under the refrigerator is a care, and it is often most annoying if forgotten, but with all this it is not a menace to the health of the family, as might be the risk of sewer-gas coming through the pipe into the refrigerator.

Method of cleaning. Once a week the refrigerator should have a thorough cleaning and airing. Everything should be taken from the interior. The shelves and racks should be washed in hot suds, rinsed in hot soda-water, and finally in clean hot water. They should then be wiped dry, and, if possible, placed in the open air to become perfectly dry; should the weather be stormy, place them near the fire to dry. See that there is not a particle of anything left in a groove or mesh. Next wash the interior of the refrigerator, first with soap and water, then with mild soda-water, and finally with clean hot water, using a wooden skewer to clean all the grooves and ledges.

The ice-chamber needs special attention. See that the waste-pipe is clean by running a flexible wire through it. If

a cloth is put on the flexible wire the pipe may be more thoroughly cleaned. Pour hot soda-water and then boiling water through this pipe. Then wipe every part of the refrigerator perfectly dry, and let it remain open for an hour or more.

Cleansing of water-pipe.

Caution: It must be remembered that water-soaked wood, when kept from light and air, will scent and flavor any food that is placed in a closed chamber with it. The refrigerator should be so lined that not a particle of moisture can reach the wood used in its construction. Should the lining be cracked or broken, it must be repaired at once. It will be infinitely better to live without a refrigerator than to use one that is not in perfect condition.

THE SINK

The kitchen sink should be absolutely sweet at all times. To keep it in this condition requires systematic watchfulness.

When the dish-washing is finished, and the dish-towels and dish-cloths have been washed, half fill the dish-pan with hot soapy water. Wash every part of the sink with this, not missing a ledge or a groove. Wipe all the tiling or woodwork above and around the sink. Pour this water into the sink, and fill the pan with clear hot water. Rinse the sink, dish-pan, and cloth in this, wipe the pan, and hang the cloth out to dry. Let several gallons of clear cold water run through the pipes. If the sink is iron, and will not be used for several hours, wipe it dry after the cold water has been poured in.

TO CLEAN AN IRON SINK

Sometimes an iron sink gets into a rough, rusty condition which no ordinary treatment can remedy. Quicklime, combined with some fatty substance, such as oil, lard, mutton or beef fat, will remove rust and give a smooth, clean surface to the iron.

To remove rust from sink.

Rub soft mutton fat on the bottom and sides of the sink, then cover with powdered quicklime, and let the application stand overnight. In the morning wash off the lime with plenty of water and an old sink-broom; then wash the sink with a hot solution of sal-soda, using a cloth attached to the sink-broom for this purpose. Unless the rust is very deep, the sink will be perfectly free from it, and smooth and clean. If, however, any rust remains, apply the fat and lime a second time. Use great care not to spatter the lime on surrounding objects, as it will take the color out of fabrics and mar painted or varnished surfaces.

Danger of spattering lime.

Rusted iron or steel of any kind may be cleaned in the same manner.

The iron sink should be greased once in a while overnight with mutton fat, and have a thorough washing the next morning with the hot solution of soda.

Regular care of iron sink.

Sal-soda is also very good for cleaning iron and steel utensils.

CARE OF CELLAR

In no part of the house is there greater necessity for constant watchfulness than in the cellar. It should be thoroughly cleaned twice a year. In these two yearly cleanings the method of proceeding is this:

Method of cleaning cellar.

1. Open the windows. Sweep walls, ceiling, and floor in one part of the room.

2. Brush all light, movable articles, and place in the cleaned part of cellar.

3. Sweep walls, ceiling, and floor of remainder of the room, and brush thoroughly all stationary articles.

4. Let dust settle, and sweep and dust a second time.

5. Wash windows, tables, closets, etc. If whitewashing is to be done, this is the time to do it.

6. Return articles to their proper places, and put screens in windows.

If there are coal- and wood-bins in the cellar, this is the time to clean them, and also the furnace, if there is one. The cellar should be inspected once a week.

When windows should be opened.

In summer the windows should be opened every night and kept closed during the daytime. The reason for opening the windows at night and closing them in the daytime is this: The outdoor air in the daytime is much warmer than in the cellar. This warm, moist-laden air enters the cooler atmosphere of the cellar, and the moisture condenses and rests on all surfaces, rusting metallic ones, and making the cellar damp and warm. By opening the windows at night and closing them in the daytime the cellar is kept dry, cool, and pure.

In winter, mild days should be selected for airing this part of the house.

If the house is closed for the summer, it is best, when it can be done with safety, to leave two windows open on opposite sides of the cellar, that there may be a strong current of air blowing through all the time.

The screens for the cellar.

Two sets of screens are necessary for the cellar windows: strong gratings, as a protection against thieves, and fine wire netting, as a protection against flies and small animals. If all this is done, and no animal or vegetable substance allowed to decay here, one may feel that the house is on a healthy foundation.

HOUSEHOLD REFUSE

Disposal of refuse.

What to do with the household refuse is often a most perplexing question, particularly when one lives in a small town or country place. In large cities the government disposes of the refuse. But even when the city makes a final disposition of the garbage, it

does not relieve the housekeeper from the responsibility of seeing that it is kept in proper receptacles and removed at the proper time. No matter where one lives, it is possible to control this matter so that it shall not be a menace to the health or offensive to the sight.

Everything feasible should be done to dispose of the household refuse in the shortest period possible.

There are two kinds of refuse which the housekeeper has to deal with. One belongs especially to the kitchen—vegetable and animal refuse; the other is the ashes, sweepings, etc., from all parts of the house.

Two modes of disposing of garbage.

There are two modes of disposing of the kitchen garbage. The first and most sanitary is by burning; but this is not always possible, particularly in large families where many fresh vegetables and fruits are used. The second method is to place the garbage in a tub, which is emptied two or three times a week, as the case may be. This tub must be washed each time it is emptied, and once a week in warm weather it should be rinsed with carbolic water—a teaspoonful of carbolic acid to a pint of water.

Disposal of refuse in country places or small towns.

If one lives on a farm, of course all the refuse food is utilized while yet fresh for the animals on the place. But when one lives in the country, and yet not on a farm, some other way must be found to dispose of this refuse. If it must be kept on the grounds, the best way is to have a garbage-heap as far from the house as possible. Sprinkle it generously each day with lime. Ashes and other refuse should be put in barrels, never in bins or heaped on the ground, either in the cellar or in the yard. In barrels they require but one handling, and can be taken from the premises without much trouble. They should be removed as often as possible. Ashes dry out the barrels, it is true, but they may be prevented from dropping to pieces by rinsing in water.

The back yards, outbuildings, etc., should have the same care as the house. Everything must be kept in order, no damp or decaying substance left in dark or out-of-the-way places.

Outbuildings and back yards must have same care as houses.

There is now on the market a most valuable invention, which can be attached to the range, and in which all the kitchen refuse can be carbonized.

CARE OF THE PLUMBING

The more plumbing there is in the house, the greater the responsibility of those in charge. If, however, it is the best of its kind, with an abundant supply of water for flushing, and each person understands and does his or her duty, there need be no trouble.

Simply letting dirty water or other substances discharge into the pipes is not enough. There should be such a generous rush of water following that every particle of contaminating substance shall be carried *at once* from the pipes into the sewer.

Nothing is more common than to find that this is neglected, even by well-educated people who should know better. It would not be a bad plan to have a printed notice in the closet of every private house, as is often the case in public places, to the effect that the valve from the flushing-tank should be kept open for a certain period of time, that at least two or three gallons of water may flow into the pipes.

The need of having printed notices in closets in private houses.

When set bow's are used, it is not enough that the soiled water is allowed to pass into the pipes; it should be followed by some clean water.

Kitchen and other sinks where dishes are washed, and where greasy water and the water in which strong-odored vegetables have been cooked are poured down the pipes, should have a thorough flushing with hot water, followed by cold water, two or three times a day.

Thorough flushing of kitchen sink.

Whenever the water in which cabbages, cauliflower, turnips, beans, etc., have been cooked is poured into the drain, it should be followed *immediately* by plenty of cold water. Should one live in the country, where water for flushing is not plentiful, such refuse water had better be poured on the earth, some distance from the house.

Liquid grease will cause serious trouble if it is allowed to remain and cling to sides of pipe.

Liquid grease will chill as it reaches the pipes, and it will often cling to the sides. Other substances attach themselves to the particles of grease, and, naturally, if nothing be done to wash the pipes clean, these substances decompose and send their vile odors through all the pipes and into every part of the house. It is not an uncommon thing to find this odor in houses where the plumbing is apparently of the best. It is beyond the plumber's art to prevent this, but it is within the power of every housekeeper to avoid it. Once knowing what causes the trouble, the remedy is simple. A strong hot solution of washing-soda will dissolve the grease, and if enough hot water follow to carry it from the pipes the trouble is removed.

A strong soda solution will dissolve grease.

Sometimes in large establishments like boarding-houses and hotels the amount of grease from dish-washing is quite large, and, there being so many people at the work, the responsibility is not placed on any one, and the accumulation of grease and other putrefying substances is often so great that a more caustic agent than common washing-soda is required. In that case pour dissolved potash into the pipes.

How to treat kitchen sinks once a week.

The kitchen and pantry sinks should be treated with a hot solution of washing-soda at least once a week. One should not wait until an odor is perceptible, but attend to this regularly, the same as washing or any other cleaning process.

All the plumbing is better for being rinsed with the hot solution of soda, but once a month answers for all parts of

the house, except the sink, provided the plumbing is in good condition and there is no illness in the house. In case of illness it is well to use a disinfectant every few days. If the disease be contagious the disinfectant should be used every day for the protection not only of the family, but of the whole neighborhood.

In case of illness in house use disinfectants freely.

When using chemicals in bath-room and set bowls the metal around the pipes should be protected. This is easily done. Have a funnel which fits into the opening in the pipe, and through this pour the chemicals. Where the openings of the pipes are covered with strainers, the point of the funnel can be flattened to fit the long, narrow openings.

How to protect the pipes when using chemicals.

When strong acids or very caustic alkalis are used to disinfect the plumbing, they should be followed, after a short interval, with a thorough flushing of the pipes.

Thorough flushing of the pipes must follow the use of strong acids or alkalis.

Washing-soda is not injurious to the metal pipes; but when the caustic potash is used, it is best to flush thoroughly in about half an hour.

To prepare the washing-soda for the pipes, cover one pint of soda with three gallons of boiling water, and let it remain on the fire until all the soda is dissolved. Pour this, boiling hot, into the pipes. Use two quarts for each of the sinks; the remainder to be poured into pipes of the set bowls, bath-tubs, closets, laundry-tubs, etc.

How to prepare soda for the pipes.

The sink-pipes should be made warm by pouring boiling water into them before pouring in the hot solution.

If there should be a stoppage of the pipes by grease, make the solution four times as strong.

To prepare the potash for the sinks, open a pound box, and put the potash in a large pitcher; then add two quarts of cold water, and stir with

How to prepare potash for the sinks.

a wooden stick until nearly all the crystals are dissolved. Have the pipes warmed with boiling water, and pour in the solution of potash. When using potash, protect the hands with old gloves; turn the contents from the box very carefully and gently; keep the mouth closed; be careful not to drop any of the liquid on your clothing or floor, as it will destroy color, fabric, paint, or varnish.

The odor of most disinfectants an objection to their use.

There are many chemicals that both disinfect and deodorize the plumbing; most of them, however, replace the obnoxious odor by one of their own. This is the case with carbolic acid, which is a reliable disinfectant, but which many persons dislike to use because of the strong and lasting odor. When one realizes how clean and effective this chemical is, the odor will not be a great barrier to its use.

Potassium permanganate is a good disinfectant and deodorizer. It is odorless, and perfectly safe to use anywhere.

Disinfectants must come in contact with the cause of trouble in order to remove it.

Solution must be used in sufficient quantity to reach all sides of the pipes.

It has been demonstrated that disinfectants must come in contact with the organism that produces putrefaction or disease in order to kill it; therefore, whatever substance may be used, it should be applied in such a manner that it shall reach all the sides of the pipes. To do this the solution must be poured into the pipes in such a quantity that they shall be filled for at least an instant. Make about a five-per-cent. solution of carbolic acid by adding ten ounces of the crystals or liquid carbolic acid to about three gallons of water. This answers for basins, bath-tubs, etc.; but the water which rests in the bowl of the water-closet dilutes whatever substance may be poured into it; therefore this water must have a stronger dose of the disinfectant. Pour a little carbolic acid into this bowl, and then pour in about two quarts of the carbolic-acid solution. Do not open the valve of the flushing-tank, as that would

dilute and carry the disinfectant away before it had time to do its work. Pour the solution into the pipe quickly, that there may be volume enough of the liquid to touch all sides as it flows down. Do not flush for twenty or thirty minutes; then flush thoroughly.

Potassium permanganate is used in the same manner. Dissolve half a pound in four gallons of water. It will give a rich purple solution. A few of the crystals may be dropped into the pipes at any time.

There are many disinfecting articles on the market; some of them are very good. Directions as to how they shall be used come with them.

Copperas is excellent to use in drains and closets. The solution should be strong, about three pounds to two gallons of water.

Carelessness the usual cause of trouble with plumbing.

Careless and ignorant people are the cause of a great deal of trouble with plumbing. They throw all sorts of things into the bowls and closets. It is important that each person should be made to see the necessity of treating these conveniences with the greatest care and respect. But the greatest enemy of the pipes is any fibrous substance that can wind itself around joints and traps. Hair and *lint* are worse than any other substance in clogging pipes.

Greatest enemy of the pipes.

Avoid the use of worn or linty cloths for cleaning purposes.

Well-worn *linty* cloths should *not be used* for cleaning in a house where there is plumbing. You will do the sick and yourself a favor by sending all the worn white cotton and linen where there is illness, rather than keeping it for cleaning purposes. Dish-cloths, as soon as they become so worn that they give off fine particles of lint, should be destroyed; so should floor- and all other cleaning-cloths.

CHAPTER V

THE LAUNDRY

Soaking the clothes. Washing the clothes. Summary of the work. To prepare bluing-water. Flannels. Colored flannels. Summary. Blankets. Colored-cotton articles. Washing with starch. To make the starch. Silk undergarments. Washing with kerosene. Lace curtains. Starching. To make gum-arabic starch. Stiffening with gelatin. Boiled starch. Raw starch. Hanging clothes out to dry. Folding clothes for ironing. Preparing for ironing. Folding the clothes after ironing. A few words about the clothes-wringer. The laundry. How to dissolve soap. How to clean irons.

Need of study in caring for laundry.

The laundry, and all connected with it, is one of the branches of domestic economy which we keep as much as possible out of sight, and, indeed, out of mind. Yet so much of the health, comfort, and decency of life depend upon the cleansing of the personal and household linen that this subject should be studied carefully and intelligently by each housekeeper. It is very important that the fabrics should be washed in such a manner that all dirt shall be removed without too great a strain upon the tissue of the fabric. The best authorities are divided as to the most effectual means of doing this Hard rubbing wears the fabric; chemicals loosen the dirt and thus relieve the cloth from so much or so hard rubbing; but at the same time the chemical does not stop with the dirt—it attacks the fabric also. It has seemed to me

that an intelligent use of chemicals to aid in loosening the dirt is better than hard rubbing alone; but if the chemical is not used with the greatest care and intelligence, the use of soap and water and extra rubbing must be relied upon. One great trouble in using a chemical in the laundry, as elsewhere in the house, is that it is expected to do all the work, instead of its being looked upon simply as an aid. The chemical most commonly used in the laundry is sal-soda. If the water is hard, this or some other substance is almost a necessity.

Intelligence needed if chemicals are used.

When using soda, ammonia, borax, Javelle water, etc., it must always be borne in mind that they must not be used in such quantities that they do away with the work of rubbing. The rubbing will be less hard, and may be done in less time; that is all. The chemical loosens the dirt, so that it yields quickly to sopping, squeezing, or rubbing. All chemicals should be *dissolved* and then mixed with the water.

Use of soda, borax, etc.

All clothing should be rinsed very thoroughly. When a chemical is employed the necessity for thorough rinsing is even more important than when only soap and water are used. A chemical should be thoroughly dissolved and mixed with the water before the clothes are put in the tubs.

Careful rinsing necessary.

SOAKING THE CLOTHES

Good laundresses are not all of the same opinion as to the desirability of soaking the clothes several hours before washing. It seems to me reasonable that the dirt should yield more readily when the fabric has been soaked in tepid suds, or even in cold water, for several hours; and certainly when an alkali is used in this manner it does its best work, because it has time to act upon the dirt, which is removed

with ease when the articles are put into fresh suds and rubbed by the laundress.

Monday is the accepted wash-day among most housekeepers, but there are many who take Monday for preparing for the washing. This is a matter which every housekeeper must decide for herself.

All garments should be mended before washing.

As far as possible, the clothing should be mended before it is put in the wash; a rip or tear may increase ten times the original size in the process of washing, drying, and ironing.

Stains should be removed.

Every article should be looked over for stains, and if there are any that soap and water will not remove, or, still worse, will set, they should be taken out at once, if possible. Next, the clothing should be sorted, the finest and cleanest being put in a heap by themselves, the most soiled and the medium soiled in other heaps.

How tubs shall be prepared for clothes.

Cut laundry soap in fine shavings, and put it, with boiling water, on the back of the range, where it will dissolve slowly. This should be done an hour or more before it is time to soak the clothes. Fill three tubs half full of tepid water, add enough of the dissolved soap to make a strong suds, and put the three heaps of clothes in the suds, having the most soiled pieces in a pile at the bottom and the cleanest pieces on top. Rub a little soap on the portions of the personal linen—the neck and sleeve-bands, for example—that are most soiled; if soda must be used, this is the time for it. Mix the dissolved soda in the suds before the clothes are put in.

WASHING THE CLOTHES

In the morning wring out the two tubfuls of the cleanest clothes. Wash the tubs, and fill nearly half full with water as hot as you can bear your hand. Fill the boiler half full

of cold water, and add enough dissolved soap to make a light suds. Put the cleanest clothes in one of the tubs of hot water, and wash them, using soap wherever it is needed. As the clothes are washed turn them and wring them, then drop them into the second tub of water, and wash them a second time in it, using soap, if there is necessity, as before. As each piece is wrung from this water, soap it, and drop it into the cold water in the boiler; when the boiler is full, light the fire, and let the clothes scald, pressing them down in the water with a wooden stick. If the boiler is to be placed on the top of the range, put it in place before filling. If soda is used, put in a tablespoonful of liquid soda (see "Liquid Soda") to every three pailfuls of water.

How clothes shall be scalded.

While the first tubful of clothes is scalding, rub out the second in the same manner, and then continue with the third.

When the first boilerful of clothes is scalded, take them up and put them in a tubful of cold water, rinse, and then rinse in a tubful of bluing-water; then hang out to dry. The sun and pure air will give the clothes a whiteness and sweetness that nothing else can. This is the treatment for all white clothes.

In the whole process of laundering there is nothing as important as thorough rinsing. No matter what care has been taken with other work, if the clothes are not thoroughly rinsed they will never have a good color.

Rinsing of great importance.

SUMMARY OF THE WORK

1. Mend.
2. Remove stains.
3. Sort the clothes.
4. Dissolve soap; make tepid suds in three tubs; put pieces most soiled at bottom and cleanest on top. Soak overnight.

5. On washing-day wring clothes from soaking-water; fill two tubs with hot water, add dissolved soap and soda, if used; fill boiler with cold water; wash clothes out of one water, then in second; soap, and put in boiler. Light fire under boiler. When clothes are scalded rinse in two or three clean waters, then in bluing-water; wring dry, and hang in open air to dry. All the white clothes are to be treated in this manner.

TO PREPARE BLUING-WATER

The water for bluing may be cold or tepid. If liquid blue is used, pour a little in the water and stir it well. Take some of the water in the hand, and if it is sky-blue it is dark enough.

Safest blue to use.

The ball-blue is safe and satisfactory. Put the balls in a small flannel bag, and tie firmly. Fill a bowl with tepid water, and move the blue-bag through the water until it becomes a deep dark blue; then pour it into the tub. Test the water to see if it is blue enough.

What fabrics absorb most readily.

It must be remembered that soft, loosely woven fabrics absorb the blue much more readily than closely woven stuffs. Never let clothes stand in bluing-water, as it will make them streaked.

As each article absorbs a portion of the blue in the water, those that are put in first will be bluer than those that follow. A good plan is to blue the water only slightly at first, adding a little of the dissolved blue as the pieces are rinsed.

FLANNELS

In washing flannels the first care is to prevent them from shrinking and to keep them soft. They should be washed on a clear bright day, and dried as quickly as possible.

Shake all lint and dust from the flannels. Prepare three tubs with water as warm as the hand can bear comfortably. Put enough dissolved soap in one tub to make a strong suds, and to every three gallons of water add one tablespoonful of borax dissolved in a pint of hot water, or instead of the borax two tablespoonfuls of household ammonia may be used. Put the white flannels in this suds, and wash them by sopping up and down and squeezing; rub them as little as possible. Squeeze them from this suds, and wash them in a second tub of warm water, to which has been added a little dissolved soap. Turn the garments in this water. If you like a little bluing in the flannels, have a third water of the same temperature as the other two, make it slightly blue, and put the washed flannels in it. Then put the flannels through the wringer, shake them well, and hang in the open air to dry. Before they are quite dry take them in, fold and roll in a clean cloth, and iron as soon as possible. The iron should not be very hot, and there should be a great deal of pressure used.

Method of washing.

Rubbing flannel thickens and hardens it. Inequality in the temperature of the water in which flannels are washed and rinsed shrinks them. Never use yellow soap for washing flannels, because it contains resin, which is bad for woolens.

Do not rub flannel.

If the water is hard, a *little* dissolved borax or ammonia may be put in the last water. This will keep the flannels soft. If the state of the weather interferes with the drying in the open air, hang the flannels in a warm room, but not too near the fire, heating-pipes, or register, as a high temperature will harden and shrink them.

The temperature of the water in which flannels are washed is not as important as that each successive tubful through which they are passed should be kept at the same tempera-

Temperature of water must be uniform.

ture from the beginning of the washing of the flannels to the end. The work should be done as quickly as possible, and only one or two pieces should be wet at a time. As soon as the flannels are wrung out of the rinsing-water, shake them out and hang them out to dry. The thicker side should be uppermost. Pin the flannels on the line in such a manner that they will not be pulled out of shape.

Drying loosely woven articles. Loosely knitted or crocheted articles are likely to get out of shape if hung up to dry in the ordinary way. Pull them into shape, and lay them on a piece of cloth,—a piece of a sheet is good for this,—and fasten them in place with safety-pins. When the garments are half dry, turn the sheet upside down, that all parts may be subjected to an equal strain.

COLORED FLANNELS

These are washed in the same way as the white flannels, omitting the borax and ammonia, except when very hard water has to be used; in that case a little borax may be put in the water.

In washing blue flannels the color may be revived by acetic acid or vinegar. Put about a tablespoonful of the acid or a gill of vinegar in the rinsing-water.

SUMMARY

1. Shake flannels free from lint and dust.
2. Wash in strong suds which contains either borax or ammonia.
3. Rinse in water of the same temperature as the suds.
4. Never rub or wring flannels with the hands, as this twists and hardens the texture.
5. Dry as quickly as possible, but press before fully dried. Do not use *hot* water with flannels. Use borax with colored flannels, as ammonia changes the colors.

BLANKETS

Select a clear windy day on which to have the blankets washed. If there are colored bindings on the blankets, take them off and replace them with white ones.

When and how to wash blankets.

Examine the blankets to see if there are any places that are very much soiled; these should be kept in mind during the washing.

Half fill two tubs with hot water. Pour enough dissolved soap into one tub to make a very strong suds, and into the second tub pour about half as much soap.

Dissolve three tablespoonfuls of borax in a quart of water, and pour half of this mixture into each tub.

Shake the blankets well to remove dust and lint. Put them in the first tub, and sop them up and down until the dirt appears to have been removed. Squeeze the water from them and put them in the next tub, washing them again in the same manner.

Now rinse the blankets in a very weak suds, and run them through the wringer. The screws that tighten the rollers of the wringer must be loosened for thick blankets. After they have been through the wringer, shake the blankets well, and hang them out to dry, pinning them in several places so that an undue strain will not come on any one part. All three waters in which the blankets are washed must be of the same temperature.

How to remove spots.

If there are any spots that the sopping and pressing do not remove, spread that part of the blanket on a board and rub it with a brush. This does not twist the fiber, as would the rubbing with the hands or on the wash-board.

Wash only two blankets at a time. Have fresh water for every pair. As this is heavy work, one woman should not be required to wash more than two pairs of blankets in one day.

The blankets should be perfectly dry before they are taken from the lines, and then they should be folded carefully. To press the blankets, spread a sheet on the table and put the folded blankets on it; draw the sides of the sheet over them so as to cover them completely. Place a board on the top of the pile, and on it put a heavy weight; let the blankets remain under this for a day or two. This will press them sufficiently.

The best way to press blankets.

COLORED-COTTON ARTICLES

Colored cottons must be washed, dried, and ironed with great care to prevent their fading and "running."

No alkali or strong alkaline soap should be used on them; for soda, ammonia, Javelle water, etc., will destroy the color. Whenever it is possible, they should be washed without soap. Starch of any kind may be substituted for soap.

Water should be warm, not hot.

The water in which colored cottons are washed should never be hot; it should be merely warm. Soap should not be rubbed on colored cottons: they should be washed in strong suds made with warm water and dissolved soap.

These fabrics must be rinsed in two rinsing-waters, and salt should be put in these waters to prevent the colors from running. If there are blue garments that have become a little faded, put a cupful of vinegar in the last rinsing-water.

How colored materials should be rinsed and dried.

Colored materials are starched, before being dried, with boiled starch. All colored pieces should be dried as *quickly* as possible, and in the *shade*.

Wash the articles in a strong suds; wring them from this, and drop them into a tub of cold water in which two tablespoonfuls of salt have been dissolved.

When all have been washed in the suds, rinse them in the first rinsing-water, and again in a second. Have the starch

cold, thin, and strained, and put enough for one or two pieces in a bowl. Dip each piece in this, wring dry, and hang out. When the starch gets thin, add some of the fresh starch to it before putting in another piece. Let colored articles get perfectly dry. They should be dampened only a short time before being ironed.

When and how to starch colored fabrics.

WASHING WITH STARCH

Colored garments washed with starch have the texture and appearance of a new fabric. Any kind of starch may be used. The points to be careful of are that there shall be starch enough to remove the dirt, that the starch shall be strained so that there are no lumps, and that in ironing the garment shall be ironed thoroughly.

The starch may be made from common flour, corn-starch, fine laundry starch, grated potatoes, rice-flour, or the water in which rice has been boiled. It should be as thick as thin cream, and this should be diluted with four times its volume of warm water—one quart of starch to four quarts of water. These proportions are for the first water in which the garment is washed. The second water should be composed of eight quarts of water and one quart of starch.

How starch may be made.

TO MAKE THE STARCH

Mix to a smooth paste half a cupful of corn-starch, or rice-starch, and one pint of cold water. Pour on this, stirring all the time, three quarts of boiling water. Cook for five minutes, stirring continually, then add three quarts of cold water, and strain through cheese-cloth.

How starch should be made.

Flour-starch is made in the same manner, except that a cupful of flour is used.

To wash a garment with the starch, put two and one half quarts of the starch into a tub with eight quarts of water. Wash the garment in this thoroughly, just as you would with soap-suds. Have eight quarts of warm water in a second tub, and one pint of the starch. The garment is to be washed in this water, and rinsed in plenty of cold water. Turn it wrong side out, and put on the line at once. When dry, sprinkle, and iron on the wrong side. The method of washing with starch is by all odds the most satisfactory for dark prints, cambrics, sateens, etc. Garments that are very much soiled require twice the quantity of starch mentioned above.

To wash garments with starch.

SILK UNDERGARMENTS

Articles made of silk should always be washed in tepid water, and the soap used on them should not be caustic. White Castile soap, or any good white soap, will answer. If the silks are to be kept white, *ammonia* should not be used, as it gives a yellow tinge; a little borax, however, may be used. If the silk is of an écru shade, ammonia may be employed.

Materials used in washing silk.

Never rub silk garments on the board in washing; always rub them with the hands.

Make a strong suds of tepid water, and add to it one teaspoonful of borax, which has been dissolved in a pint of boiling water. This is enough for two pailfuls of suds. Put the silk garments into it, and let them stand for twenty minutes or half an hour; then wash them with the hands. Rinse in two waters, run through the wringer, and hang them out. When a little more than half dried, take them in and spread on a sheet. Roll them up tightly, let them stand about an hour, and then press them. Use a rather cool iron, and have a clean white cloth or brown paper between the iron and silk.

Method of washing and pressing.

In washing embroidered linens or colored silks, omit the borax and ammonia, and after an article of this kind has been rinsed and passed through the wringer, spread it smoothly on a dry sheet and roll it up. Let it stand about fifteen minutes, then press, with a cloth between the fabric and the iron.

Washing of embroideries and silks in colors.

WASHING WITH KEROSENE

Washing white clothing with kerosene is quite common in this country and in Europe. I give directions for the method of doing this, not because I like it or approve of it, but because, if it is done at all, it is best that it should be done properly.

Kerosene as it is used in the laundry.

The clothing should be soaked as directed in the usual method. In the morning, hot water should be added to the suds in which the clothes have soaked, and they should be rubbed out in this water.

The boiler should be half full of *boiling* water, to which enough dissolved soap may be added to make a strong suds. Two tablespoonfuls of kerosene should also be added, and enough of the washed clothing put in to fill the boiler moderately full. Let the pieces boil half an hour.

It is important that the kerosene be added to the *boiling* water.

Take the clothes from the boiler at the end of that time, and put them in a tub half full of suds. Add sufficient cold water to the suds in the boiler to fill it half full, and enough soap to make a strong suds. When this boils, add a tablespoonful of kerosene, put in a second batch of the clothes, and boil half an hour. Proceed in this manner until all the clothing has been boiled.

In the mean time wash the boiled clothing from the suds, rubbing any portions that are not clean; rinse in three waters, wring, and hang out to dry.

The advantage of this method of washing is that it does

away with much rubbing; but there must be the greatest care in rinsing. The pieces must be rinsed in many waters; but even when this has been done thoroughly, I have never yet seen clothes washed by this process that did not retain a slight odor of the kerosene. This is most disagreeable in sheets, pillow-cases, towels, and napkins, or, indeed, in any article that comes near enough to the face to allow an odor to be perceived. One of the charms of fresh linen is the pure, delicate odor that should be a part of it. It is to be hoped that this method of washing clothes with kerosene will not be encouraged by housekeepers.

LACE CURTAINS

The difficulty in washing lace curtains is to keep them in shape, and to avoid tearing them. As they will not bear hard rubbing, the dirt must be removed by soaking them, and sopping them gently.

Great care necessary in the washing of lace curtains.

Fine lace curtains should not be made too stiff; but the coarser the lace, the more starch will be required. The stiffening may be of starch, gelatin, or gum arabic. Borax helps to hold the stiffening in starched materials.

If it is desired to give the lace an old look, dip the curtains in tea or coffee after the last rinsing; or the stiffening mixture may be colored with tea, coffee, or saffron. Coffee is apt to leave an odor.

Coloring for lace.

Fill a tub half full of tepid water; add to this half a pound of soap dissolved in two quarts of water, and two tablespoonfuls of borax dissolved in a quart of boiling water.

Method of washing lace curtains.

Shake the dust from the curtains, and put them to soak in this water, letting them stand overnight. In the morning half fill a tub with hot water, and add a tablespoonful of dissolved borax and enough dissolved soap to make a good suds.

Sop the curtains from the water in which they have been soaking. *Squeeze* the water from them, and put them in the hot suds. Sop and squeeze them in this water until all the dirt has been pressed out, then rinse them in clear water until there is no trace of soap or dirt. Squeeze them as dry as possible, and spread them on the grass, or hang them on the lines, to dry. When dry, starch them, and draw them into the shape and length you wish, and fasten them into the frame, if you have one. If a frame is lacking, cover a mattress with a clean sheet, and draw the curtains into shape on this, pinning them down. The mattress should be outdoors, or in a room where the windows may be kept open. Of course the curtains will have to be folded when treated in this way, as it would not be possible to find a mattress long enough to admit of their being stretched at full length.

How to dry lace curtains.

It will often be found that, after washing, the curtains are of uneven lengths. To obviate this, measure the length of the curtain before washing; then, when stretching on the frame or mattress, measure both sides, and stretch them to get the original lengths. When this is done, they may be drawn gently to their full width. The curtains will hang better if, after having been dried in this manner, they are pressed with an iron that is not very hot.

Measure before washing and stretch when drying.

STARCHING

Starching should be done with the greatest care; for if not properly done, the articles will not look well, no matter how much care may be exercised in ironing.

Necessary care when starching.

Starch is made from a great variety of vegetables. Besides the pure starch which is generally used, gums and gelatins are sometimes employed for special articles, like silks, laces, veils, curtains, etc.

Materials used in starch.

Turpentine is sometimes used in raw starch to give a gloss and whiteness.

1. Borax is used to give gloss and prevent the starched article from losing stiffness when exposed to dampness. Boiling for a long time makes starch clearer and less likely to stick.

2. For muslins it is very important that the starch should be thoroughly boiled, that the muslins may look clear.

Starch should be thoroughly boiled for muslins.

3. The water in which rice has been boiled makes a good starch for colored articles, white skirts, and any garments that are not to be made very stiff. Raw starch makes articles stiffer than boiled starch. Sometimes cuffs, collars, and shirt-bosoms that have been starched in the hot boiled starch are dampened with raw starch to give them extra stiffness.

Gum arabic for delicate fabrics.

4. Thin handkerchiefs, silks, laces, etc., are often stiffened with gum arabic. This gives them a finish like a new article. The purest gum arabic is used for this purpose, because it is almost colorless.

Laces, lace veils, silks, etc., have more of an appearance of newness when stiffened with this preparation than when starch is used.

TO MAKE GUM-ARABIC STARCH

Put an ounce of the gum in a wide-mouthed bottle, and cover with half a pint of cold water. Place the bottle in a pan of cold water on the fire. When the gum is dissolved, strain it through a piece of cheese-cloth into another bottle, and when it is cold add half a gill of alcohol. Cork and put away for use. A portion of this may be diluted to suit the article to be stiffened. This preparation will keep for years. Articles stiffened with gum arabic, isinglass, gelatin, or rice-water are apt to be a little off color, so it is best not to use these substances when absolute whiteness is required.

STIFFENING WITH GELATIN

Either gelatin or isinglass makes a satisfactory stiffening for colored fabrics. Silks that have been washed, and that require a little dressing, cotton or silk curtains, etc., are all improved by a slight stiffening with either of these substances.

Use of gelatin to stiffen colored fabrics.

Soak one fourth of an ounce of gelatin or isinglass in half a pint of cold water for one hour. Pour on this one quart of boiling water. Stir until all the gelatin is dissolved, then strain, and it is ready for use. The articles to be stiffened should be wrung dry and dipped in the prepared gelatin, then wrung and dried, dampened and ironed, the same as if boiled starch had been used.

Directions for using gelatin or isinglass.

Weak tea or coffee may be used instead of the boiling water, if a slight écru tint is desired.

BOILED STARCH

The amount of boiling water used in making a boiled starch depends upon the degree of stiffness desired; shirt-bosoms, cuffs, and collars requiring the greatest degree of stiffness, while laces, table-linen, and underclothing require the least.

Notes on starch and the various degrees of stiffness required.

When articles must be very stiff, as is the case with shirts and collars and cuffs, a combination of the boiled and raw starch gives the best results. The following preparations will be a guide for the inexperienced laundress:

No. 1.

Very stiff.

1 tablespoonful of starch.
2 tablespoonfuls of cold water.
1 gill of boiling water.

This is to be used for cuffs, collars, and shirt-bosoms that are to be made very stiff.

No. 2—the same rule as No. 1, using half a pint of boiling water. This is for shirt-bosoms, cuffs, and collars when they are to be wet afterward with raw starch. Coarse lace curtains, collars and cuffs of shirt-waists, etc., require starch of about this strength.

Moderately stiff.

No. 3—the same as No. 1, except that three gills of boiling water are used. This will be about right for white skirts and other articles that should be fairly stiff.

No. 4—the same as No. 1, using one pint of boiling water. This is suitable for skirts, dresses, etc.

No. 5.

Merely a suggestion of starch.

1 tablespoonful of starch.
2 tablespoonfuls of cold water.
2 quarts of boiling water.

This starch is suitable for table-linen and laces that should not have more than a suggestion of starch.

Starched articles may be ironed more easily, and they take a better gloss, if an oily or waxy substance is dissolved in the starch. A bit of wax or sperm candle, a bit of lard or mutton suet, will answer the purpose. A little borax added to the starch gives a finer gloss to the ironed article, and enables it to hold its stiffness in a damp atmosphere, such as that at the sea-shore.

How to secure the greatest ease in ironing starched articles.

The starch must always be boiled until it is clear. The water and every utensil used in making it must be absolutely clean.

To make the starch, have the water boiling. Mix the dry starch with cold water. Gradually pour the boiling water on this mixture, stirring all the time. Stir over the fire until the starch looks clear. It

Methods of making starch.

will take about ten minutes' cooking for this. To the rule given, add a piece of candle or lard about the size of a white bean, and half a teaspoonful of powdered borax. Strain the starch through a piece of cheese-cloth. If the starch has been stirred continually during the cooking, and is used at once, it will not require straining.

Bluing starch.

If a suggestion of bluing is liked, add a little to the cooking starch. Both turpentine and borax give whiteness and gloss to starched linen, but they *must* be used with care, else they will injure the fabric.

RAW STARCH

1 tablespoonful of starch.
½ pint of cold water.
¼ teaspoonful of borax.
A few drops of turpentine.

This rule is for raw starch, to be used on linen that is required quite stiff. Twice as much water must be used for linen that is to be made moderately stiff. Mix the starch and other ingredients thoroughly, and strain through cheese-cloth.

Facts to remember in making raw starch.

This starch begins to settle the moment it is at rest; therefore it must be thoroughly stirred when used.

The pieces to be starched must be dry. Dip them into the starch, and rub them as if they were being washed. Squeeze them dry, and spread them smoothly on a clean sheet. One article must not be placed upon another. Fold the sheet over them, and roll tightly. If the pieces are large, the folded sheet may be run through the wringer; but for small articles this is not necessary. The starched articles should lie for half an hour or an hour.

When ironing these pieces, have a thin piece of cloth to spread over the portion being ironed. The iron must be *hot.*

Go over the article, with the cloth between it and the iron, until it is about half dry; then take off the cloth, and iron until the piece is perfectly dry. Use a good deal of pressure.

Irons must be *hot* when ironing raw-starched garments.

It is important that the iron should be *hot* when it is first used on articles that have been raw-starched, because it is only by this means that the starch becomes cooked and gummy.

Importance of articles being thoroughly damp for ironing.

It is equally important that there should be enough moisture in the fabric to combine with the starch. If a spot gets dry, it will not be either smooth or stiff. For this reason it is a good plan to have the portions that are not being ironed covered with a wet cloth. If a spot gets too dry, wring a clean cloth out of cold water, and dampen the place with it.

It takes but little time to prepare raw starch, and the work of starching the articles is slight; but it requires the greatest care to iron a large piece so that it may be smooth and of equal stiffness in every part. The cloth must be *wet*, the iron *hot* at first, and the ironing must be continued until every thread is dry.

How boiled starch is used. Care must be taken that it is evenly distributed.

In using boiled starch, the articles should be starched while wet. If the article is to be made very stiff, the starch must be used as hot as possible, and be rubbed and clapped into the linen. Great care must be taken to get the starch distributed evenly *through the threads* of the fabric, and to remove it as much as possible *from the surface*. It is a good plan, therefore, after the starch has been rubbed and clapped in, to draw the cuffs, collars, and shirt-bosoms through the fingers, thus removing the superfluous starch. Each plait of the shirt-bosom must be drawn between the forefinger and thumb.

Before beginning to starch, the hands must be washed thoroughly with soap and warm water.

All articles starched with the boiled starch must be *dried thoroughly*, and then made very damp, and rolled tightly in a clean, dry cloth. They should lie in the cloth for two or more hours before being ironed.

When using boiled starch, dry garments, then dampen and roll in a dry cloth.

Starched articles must not be hung where they will freeze.

HANGING CLOTHES OUT TO DRY

The oxygen of the air, and the sun, are great aids in whitening and sweetening clothes, and, when possible, every article should be dried in the open air.

Care of line and clothes-pins.

The lines must be fastened securely; wipe them with a clean, damp cloth before the clothes are hung upon them. Be sure that the clothes-pins are clean and whole. Clothes-pins that have lain on the ground in rain and snow are not fit to use; the best way to dispose of these is to put them in the fire. When the clothes are taken in, the pins should be put in a bag or basket kept for this purpose. When it is possible, the line should be taken down. A line that is exposed to the elements rots slowly, and soils the clothing that is hung upon it. Every piece must be turned wrong side out before being put on the lines.

Hanging clothing on the line.

Group all articles of the same kind together on the line, if possible. Do not hang the pieces by the corners, as the strain tears them and gets them out of shape. Fasten garments by the bands, when possible. They are less liable to tear when hung this way, as the heavier parts do not hang down.

White clothing should be hung in the sun, and colored clothing in the shade. Do not hang starched articles where they will be exposed to a strong wind, as the wind drives the starch out of the fabric.

FOLDING CLOTHES FOR IRONING

When clothing is folded properly, the ironing is half accomplished. The pieces should be folded as quickly as possible after they are taken from the line. Have the laundry or kitchen clean; spread a clean ironing-cloth on the table; place a bowl of clean, warm water within reach, and beside it a small brush, something like a scrubbing-brush, but about one fourth as large. Spread one article at a time on the table, dip the brush lightly in the warm water, and sprinkle the piece with it, getting a fine spray on all parts. Continue this until all the plain clothes are dampened. Be careful to keep articles of the same kind together. Line the clothes-basket with a piece of clean cotton kept for this purpose.

Preparation of clothes for folding.

Clear one end of the table for the folding, and begin with the smaller pieces. Plain articles, like napkins, towels, handkerchiefs, pillow-cases, etc., may be folded together.

Beginning with the napkins, lay a piece perfectly flat on the table, draw the edges straight, and pass the hand over the napkin, smoothing out the wrinkles; place another napkin on this, drawing it out in the same manner. Continue this until all the napkins are in the pile; then roll firmly, and wrap a towel around them. The handkerchiefs and pillow-cases should be done in the same manner.

Method of folding.

The towels are to be folded in the middle, with the edges drawn straight and the fold in the middle laid perfectly even. Place one towel upon another, as in the case of the napkins, and roll. Sheets and table-cloths must be folded in the middle, and the sides and corners matched with great care; the edges and the middle folds must be firmly drawn. Two persons can do this better than one. All the folding must

Directions for folding sheets, table-cloths, etc.

be done with care and exactness. Starched articles should be protected from the air. It is well to keep pieces of cotton cloth for this purpose and for wrapping up small pieces like napkins and handkerchiefs.

Some articles must be *very*, and others only slightly, damp.

Sheets, pillow-cases, towels, and underclothing should be dampened only slightly. Table-linen should be made quite damp, and all starched pieces should be made *very* damp.

Clothes may be ironed much more easily when they have been dampened and folded several hours. This is possible if the clothes are folded the same day on which they are washed, and ironed on the following day.

PREPARING FOR IRONING

For good work it is absolutely necessary that the table and ironing-board are firm and unwarped, and that their covering is soft and smooth.

The table and board should each have a first cover of thick woolen or cotton material; an old blanket is excellent for this purpose, and over it there should be a clean white cotton cover. These coverings may be tacked permanently on the board, but they must be removed from the table as soon as the ironing is finished.

Spread the woolen cover in place, and tack it, using the smallest-sized tacks, under the edges of the board or table, drawing it tightly so that there shall not be the suggestion of a wrinkle. Now put on the white cotton cover. Tack this in the same way, taking care to keep it perfectly smooth.

A good fire essential.

There must be a good fire for the ironing; it must not burn too rapidly, and it must never be allowed to reach a white heat.

See that the irons are scrupulously clean and smooth, and put them to heat.

Lay several thicknesses of newspaper or brown paper on

the corner of the ironing-table. At the right hand, and on the paper, place the stand for the irons. Just beyond this have a soft old cloth on which to wipe the irons.

Arrangement of ironing appliances.

See that there is a piece of beeswax tied in a piece of cloth, ready for use. Close at hand, but not on the table, place a paper on which is about half a cupful of salt. Whenever the iron seems a little rough, rub it on the salt, wipe it, and then go over it lightly with the wax, and wipe again. Be very careful to have every part of the irons, top and bottom, perfectly clean.

The irons become smoother and the heat grows more even as the ironing goes on; therefore it is better to begin by ironing some of the coarser towels until the irons get in fair condition; then iron sheets, pillow-cases, and table-cloths.

What to do till the irons are hot.

Every time the fire is replenished it takes a short time to burn up to a bright heat. Handkerchiefs should be ironed in this interval.

As soon as the irons get very hot, begin on the starched articles. Keep a few coarse towels at hand to iron if the heat of the iron needs to be tempered before it is applied to the starched pieces. Finish all the starched articles, and then go back to the plain clothing. The fire may have to be replenished several times, but it will save time, strength, and fuel if one is careful not to let it burn up to a white heat, and not to choke the draft by packing the coal in the stove. Put coal on the fire as lightly as possible. Do not shake the fire down if you can help it, for that packs the coal and cinders together, so that there is not enough space left for the oxygen to pass freely between the coals. It is as difficult for a fire to burn without oxygen as it is for us to breathe without it.

How to care for fire when ironing.

It is much easier to give explicit directions for the methods of washing and starching than it is to give them

for ironing. In this part of the laundry work practice is necessary. It is hoped that with the detailed directions given for the washing, starching, and folding, and the suggestions in regard to ironing, the beginner may find that, with practice, she can attain the best results.

Every piece should be ironed until it is dry. The greater the pressure of the iron, the smoother and more glossy the surface of the material will be.

The iron should pass smoothly and regularly over the cloth, the movement being up and down in the direction of the selvage, with the grain of the cloth.

Motion of iron.

The pressure should be light until the cloth has been made smooth; *then* press very hard. The iron should not be half lifted, or used in a jerky manner. It must rest on the cloth, and be moved rather slowly at first, to avoid making little creases. After the cloth is smooth the movement may be more rapid.

Table-linen should be ironed in a single thickness until it is perfectly dry; then it may be folded and pressed. There should be as few folds as possible in a table-cloth.

How table-linen should be ironed.

Napkins and handkerchiefs should be folded in such a manner that the initials or other markings come on the outside.

The borders of napkins and handkerchiefs should be ironed first; care must be taken to pull them even, so that they shall fold perfectly square.

Table-linen that is *fine* and *heavy* will not require starch, but the linen that lacks body is improved by the use of a *very little* starch.

When table-linen requires starch.

Each article should be hung on the frame to air as soon as it is ironed. Table-cloths, napkins, and handkerchiefs are the exceptions to this rule. They should remain folded, and be laid on some flat surface, like a board, until the ironing is finished, when they will be aired sufficiently to be put away.

FOLDING THE CLOTHES AFTER IRONING

No matter how well the clothing has been ironed, if it is carelessly folded when being taken from the clothes-horse it will never be satisfactory.

Necessity of folding clothes well after ironing.

See that a table is clear and clean. Draw the clothes-horse near it, and lift off one piece at a time. Fold each piece carefully in the creases made by the iron, and press smoothly with the hands. Be sure that each piece lies smoothly in the basket in which it is to be taken up-stairs. The table-linen should be kept in a broad drawer or box, so that the table-cloths need not be folded in too many creases.

Fasten night-dresses and night-shirts by the button at the neck, as it will then be easy to fold them neatly.

A FEW WORDS ABOUT THE CLOTHES-WRINGER

When the washing is finished, loosen the screws that tighten the rubber cylinders. Wipe the cogs and every part of the machine dry.

If the wringer works hard, pour a little kerosene on the cogs, and work them for a few seconds; then wipe them, and put a few drops of sewing-machine oil on them, and work for a minute.

On washing day wipe the machine carefully to remove any particles of superfluous oil; tighten the cylinders.

THE LAUNDRY

The necessary furniture for a laundry.

The essential furnishings of a laundry are: three or four good tubs, a boiler, stationary or portable, wash-board, clothes-wringer, clothes-stick, ironing-board, table, pail, set of flat-irons, porcelain-lined saucepan and wooden spoon for starch-making, small bowl, large

dipper for taking water from boiler, etc., ironing-blanket and -sheet, stand for irons, holders for irons, floor-cloth and cloths for washing tubs, boilers, etc., clothes-basket, clothes-line, clothes-pins and a bag or basket for holding them, and, finally, a stove or some other means of heating irons.

If the laundry, and every article in it, are not kept scrupulously clean, the work done in it cannot be satisfactory.

Must be kept absolutely clean. Everything in order before washing is commenced.

Before the washing is begun, the room should be made perfectly clean.

After the washing is finished, every article used in the work should be washed, and then thoroughly rinsed in clear water. The boiler must be wiped dry. Wash and wipe the floor. Let cold water run freely into the tubs, that every trace of suds may be removed from tubs and pipes; then wipe the tubs dry. Wash, rinse, and dry the cleaning-cloths.

After the ironing is finished, and the clothes have been removed, the room should be swept and dusted, blankets, sheets, etc., folded, and everything put in order.

Tubs, pails, etc., must be thoroughly rinsed.

If the suds from the washing are not thoroughly rinsed from tubs, pails, wringer, etc., a disagreeable odor will fill the laundry and finally penetrate to the other parts of the house.

HOW TO DISSOLVE SOAP

Shave the soap, and put it in a stew-pan with water. Place this on the fire, and let it heat slowly until the soap is dissolved, which will take about an hour.

Use three quarts of water for one pound of soap.

HOW TO CLEAN IRONS

The longer flat-irons are in use, the smoother and better they become and the more easily they are kept clean.

All irons are better for being greased, once in a while, with warm mutton tallow or sweet-oil. Let them stand a few days after the grease has been applied, wash them in a strong soap-suds, then rinse them in hot soda-water, and wipe dry. If the irons get rusted, cover the rusted part with sweet-oil and powdered quicklime, and let them stand several days. Wash this off with water, and then with strong soda-water.

Fine emery-paper will often remove rust and roughness from irons, and rottenstone and sweet-oil will clean them.

How to remove rust.

Mix powdered rottenstone with the oil, and spread on a board; work the iron back and forth on this until bright and smooth; wash in strong, hot soap-suds, or in a hot solution of sal-soda.

To insure the perfect cleanliness of irons, they should be washed in soap and water frequently. Irons should always be kept in a clean, dry place.

Importance of laundress caring for her health.

The laundress is often very careless of her health. She will leave the wash-tub, where she has become heated, and where the steam from the hot water has opened the pores of her arms and hands, and go, bare-headed and bare-armed, out into the chill wintry air to hang up the clothes. She should remember that her health is her capital, and that without it she will become a burden to herself and others. If she has perfect health and a good constitution, she ought to thank God for one of the greatest blessings that can be given to mankind, and guard it gratefully and intelligently.

How to dress warmly and quickly when hanging out clothes.

When the weather is cold or raw, wipe the hands and arms dry, pull the sleeves down, have a jacket or shawl to protect the shoulders and lungs, and put a covering of some kind on the head. This should all be done before venturing outdoors. In intensely cold weather wear clean white mittens. If the ground is damp, or covered with snow, put on rubbers.

Carefulness in these little details will prevent many colds and much impaired health.

A rubber apron will protect the clothing from the wet during the washing.

Many girls feel that they cannot afford these things; but one week's wages would buy everything but, perhaps, the sack or shawl, and one always has something of that kind on hand which is practically useless for any other purpose. Even if it is necessary to buy the wrap, it would be money well invested, and it will be the means of saving much suffering.

Money expended in care of health is well invested.

The laundress should be conscientious in her work, doing it honestly. The use of destructive chemicals should be avoided. No one has a right to use substances that will destroy the fabric. She should do by her employers as she would like them to do by her.

CHAPTER VI

CARE OF LIGHTING APPLIANCES

Management of gas. Oil-lamps. Some facts in regard to petroleum.

MANAGEMENT OF GAS

Gas and electricity. Gas and electricity are the two most convenient forms of lighting houses.

Care of gas-burners and keys. When gas is burned, the pipes should be carefully examined, from time to time, to make sure that there are no leaks. The burners should be cleaned frequently, or renewed when they do not work well. The keys should stand square when the gas is turned off. A loose key that does not indicate to a certainty when the gas is turned on or off should not be tolerated for one day.

When there is a whistling sound from the burning gas, it indicates that unconsumed gas is escaping through the burner; the key should be turned until the sound ceases.

Care of rubber tubing. If rubber tubing is used on a drop-light, always lower the light by turning off the gas at the pipe that supplies the tubing. If the light is turned off at the lamp, the extra pressure on the tubing causes some of the gas to escape. The rubber tubing should be frequently removed from the lamp and pipe, and hung in the

open air. Odor of escaping gas should be traced promptly to its source, and the leak should be repaired instantly.

Should there be a strong odor of gas in any room in the house, or in the cellar, do not carry a light while investigating it. Open the doors and windows first, that the gas may be carried out by a current of air. After a short time it will be safe to use a light, if that be necessary. If there is a suspicion of a large leak, do not test it with a lighted match; the odor should be a guide.

Leaks.

Acquaint yourself with the location of the stopcock that turns the supply of gas off from the house, so that in case of accident the gas may be cut off readily. Learn to read the meter. Some gas companies give clear directions for this on the back of their bills.

Stopcocks and meters.

When round-top burners are used, see that the flame does not spread so as to reach the globe. The flat-top burners are to be preferred, because they prevent this spreading of the flame.

Round-top and flat-top burners.

The globes should be dusted when the room is being dusted, and they must be washed as soon as they become dim or soiled. In dusting gas fixtures, be careful not to wrench or twist them. Never use a polish on the ordinary fixtures. If they are in a bad condition, have them removed and taken to the burnisher. This is, in the end, the cheapest thing to do.

Care of globes and fixtures.

OIL-LAMPS

The best lamps and the best oil are invariably the safest and cheapest. The lamps least trying to the eyes are those known as the student lamps. Indeed, there is no other artificial light, as far as I know, that is as satisfactory to work by. Every household should have at least one of these lamps. They range in price from two dollars and seventy cents to fifteen dollars or more. When the price goes much over six or eight dollars, it is

Student lamps.

owing to the metal and ornamentation, and not because of any improvement in the quality of the light. A student lamp should be chosen, like a watch, first of all for its working qualities.

Consideration in purchasing lamps.

The first consideration, in purchasing a lamp of any description, is that it must be safe, and that the burner is large enough to carry a good-sized wick.

Requirements necessary for safety.

To fulfil the requirements of safety, a lamp should stand on a firm, broad base, the oil reservoir should have no other opening than that into which the burner is screwed, and each burner should have an extinguisher.

Wicks.

The wicks should be soft and of rather a loose mesh. They should *fill* the burner, and yet not pack it. A wick that does not fill the burner will admit air into the reservoir, which, in case any gas has collected there, may cause an explosion. This matter of the wick is a most important one, and should be better understood by the dealers in lamps and lamp supplies. When a salesman fits a lamp with a wick that is too small, and an explosion follows, why should he not be held equally guilty with the drug clerk who carelessly puts up a poison instead of the correct prescription? Many of the lamp explosions which are occurring constantly might be traced to this matter of too small a wick. It is a subject that concerns every housekeeper, and an effort should be made to have the lamps safe in this respect at least.

Essentials of a clear light.

The essentials of a clear light are clean burners, clean wicks, and clean chimneys. Dirty burners and wicks not only make a clouded light, but they give off, also, disagreeable odors.

A lamp should never be lighted after standing, partially filled, for a day or two. The empty part of the reservoir *may* have become full of gas, and a jar, or a current of cold air, may cause an explosion.

In lighting a lamp, turn down the wick, and put on the chimney and shade, then gradually turn the wick up. This will give all parts of the glass time to heat slowly and to expand equally. Extinguish a lamp by turning the wick fairly well down and then pulling the extinguisher. If there is no extinguisher, blow *across* the top of the chimney, never *down* into it, as that might drive the flame into the reservoir, where it is always possible that gas may have collected.

How to light a lamp and how to extinguish.

When carrying a lamp from one place to another, turn the wick rather low, as the movement produces a current of air, causing the flame to flare up and smoke. In carrying a student lamp, lighted or unlighted, be careful not to incline it toward the burner, as that will cause the oil to overflow—a dangerous thing when the lamp is lighted, and not a desirable one at any time. Be sure, too, that this lamp stands perfectly level on the table.

When carrying a lamp from place to place.

The daily care of a lamp consists of filling it with oil, trimming the wick, wiping the burner and the outside of the lamp, and cleaning the shade and chimney. This work should be done in the morning while there is a good light.

Daily care.

For this work have a tray, a pair of sharp scissors, cloth for wiping the lamp, two cloths, one for the chimneys and one for the shades, and a small brush for the interior of the chimneys. One may sometimes find a similar brush, but very small, for washing the interior of the burners.

Necessary implements for cleaning lamps.

Cover the tray with paper. Place the reservoirs on this, removing the curved top from the burner. Turn the wick high enough to expose all the charred part. With the sharp scissors cut this off, being careful to cut straight across the wick. If there is the slightest unevenness, remove it. Now turn the wick well down, and

Method of cleaning.

with a soft paper wipe the top of the burner clean, both inside and outside. When all the lamps are in order, fill them with oil, taking care to have the oil come within an inch of the top of the reservoir, as space must be allowed for the expansion of the oil, and for the fact that the wicks draw it upward.

Be sure that the tops are screwed on firmly. See that there is no dirt in the space around the burner which admits the air. If this place becomes obstructed the lamp will be deprived of one of the essential elements of combustion, oxygen, and it will not burn brightly. Wipe the lamps carefully, and put all the parts together.

Once in every two or three weeks wash the burners in strong soap-suds or in soda-water. Many persons boil them in soda-water, but with the treatment here outlined this is not necessary, as the burners, if so cared for, will never get clogged or have a strong odor. The wiping of the lamps may be done with soft papers, which can then be burned, using the soft cloths to give the final polish.

Care of burners.

The chimneys may be cleaned by breathing into them and rubbing clean with soft paper, or they may be washed with soap and water, and polished *dry* with a clean cloth. Never leave a drop of water on the chimney.

Cleaning of chimneys.

When the supply of oil is taken from sealed cans, cut the seal and put in a stopper of some kind, which is, of course, removed when pouring out oil.

A few bubbles of air in the oil-tank of a student lamp will often prevent a free flow of oil through the narrow pipe that carries the oil from the tank to the burner, causing the lamp to give a dim yellow light. When filling a student lamp bear this in mind, and fill the tank to the top, and if any air-bubbles appear break them.

Air-bubbles in a student lamp.

A lamp in which kerosene-oil is used should burn with a

clear, white light. If the light is dim and yellow, it is owing to one of these causes: the oil is poor; the wick is charred, or the burner and wick are dirty; or the wick is turned too low; or bubbles of air impede the flow of oil.

Color of light and causes.

The wick of the lamp must be turned high enough to produce free combustion. If it is turned down low, the light is not only bad for the eyes, but the room will be filled with a vile odor. Should it be necessary to have a dim light in the room, set the lamp in an adjoining room, or shade it in such a manner that the light is not diffused. On no account lower the wick below the point where the light is white and clear.

How to regulate light.

When lighting a lamp it must be remembered that the current of air is stronger after the lamp has been lighted a few minutes; therefore the wick should not be turned to its full capacity at first.

Care when lighting a lamp.

The astral-oil that is sold in sealed cans insures a safe and good light.

SOME FACTS IN REGARD TO PETROLEUM

In this country nearly all our illuminating oil comes from the natural mineral oil, termed crude petroleum. The quality of the natural product varies greatly, but the process of refining should give a safe and good article, no matter what the condition of the original product may have been.

The oil, as it comes from the wells, ranges in color from a yellowish white to almost black, and from a liquid nearly as thin as water to a thick, ropy mass. The lighter and thinner grades are those from which the greater part of the burning oils are made. These oils are generally sold under the name of kerosene. There are other products of petroleum, however, which are used in the arts and in the household. An under-

Petroleum in its natural state.

standing of what these are, and of their behavior under various conditions, will enable the housekeeper to know why certain conditions and modes of treatment are safe, while others are dangerous.

Products of crude petroleum. From the crude petroleum we get gasolene, naphtha, kerosene, paraffin, vaseline, etc.

Purifying petroleum. The crude oil is put into immense stills, which are heated from beneath, and immediately gases begin to rise and pass over, the lightest passing over first. In this process of purifying the oil it is very important that all the oil that would vaporize or ignite at a temperature below 110° F. should be removed. If benzin is left in the oil, or added later, the chances of an explosion are increased.

To test safety of oil. When there is doubt in regard to the safety of an oil, try it by filling a cup about a quarter full of cold water. Put a thermometer into this, and add boiling water until the mercury rises to 110° F. Then take out the thermometer, and pour a couple of spoonfuls of the oil into the cup. With a lighted match or taper try to ignite the oil. If it takes fire it is unsafe and should not be used for lamps or stoves.

Oil that stands this test, or even a test as high as 135° F. if left in a lamp partially filled for a day or two, will sometimes vaporize, filling the vacant space of the reservoir with a gas that will explode if mixed with air and there is a possibility of the mixture coming in contact with the flame.

Important points in care of lamps. It is for this reason that we should not let lamps stand partially full of oil and then light them; that we should be careful that the wicks fill the burners, so that there may be no room for a passage of air; and that we should never blow down on the flame, thus running the risk of driving it against the gas that may have collected near the burner.

CHAPTER VII

FUEL AND FIRES

Kinds of fuel. Care of the furnace fire. The morning work. The cold-air box. Heating-stoves. Care of the range. Some points to remember in the treatment of range fires. Grate fires. Don'ts. To remove clinkers.

The fuel that is used for cooking and heating is an important item for the housekeeper. This is one of the household supplies that should be bought in bulk whenever possible. The best time to lay in the yearly supply is in the late summer or early autumn. Certainly the arrangements as to price and time of delivery should be made in the summer, when, as a rule, prices are lower than later in the season.

Preparation of cellar, etc., for putting in of coal.

If one lives in a city, and the coal is carried to the bin through a hole in the sidewalk, the care of putting away the coal is somewhat less than when one must see that the side of the house, lawn, and flower-beds are properly protected. In any case there is the inevitable dust and work in the cellar, and once a year is often enough for this extra work and care to fall upon the household. When the coal is to be put into the bins through an opening in the side of the house, this part of the building should be protected by thick folds of carpet or burlaps tacked over such places as are

likely to be rubbed by the men in putting the coal into the chute.

Should it be necessary to pass over the lawn, protect it by laying down boards for the men to walk over. The cellar windows must be opened, and all doors opening into the coal-room should be closed. The registers throughout the house should be closed and covered with paper. Coal- and wood-bins must be perfectly clean. All the boards used in closing up the bins should be ready for the workmen.

Protection of lawn.

After the wood and coal are in, take the carpets from the walls, fold them, and put them in place; take up the boards from the lawn, and put them, with the carpets, ready for use the next time. Sweep the cellar with a damp broom. Brush the coal-dust from walls and articles in the room, sweeping the floor a second time. Have the sidewalk swept clean, and the chips and bits of coal removed from the lawn. See that the openings used by the workmen are all properly fastened. Look after the windows and doors in the cellar; it sometimes happens that a sneak-thief thinks this is a good chance to get into the house.

Cleaning of cellar after fuel has been put in.

KINDS OF FUEL

The cost and kind of fuel used depend largely upon the section of the country in which one lives. In New England wood and anthracite coal are the principal fuels. Gas and petroleum are used to some extent for heating and cooking, and the soft or bituminous coal is sometimes used for grates.

Cost and kinds of fuel.

We speak of the two kinds of coal—anthracite and bituminous. These two coals are quite different in appearance and in manner of combustion. Pure anthracite has a high luster and burns without flame. Bituminous coal is

not so hard or lustrous, and burns with a flame; it also throws off black smoke, and for this reason is not used when the anthracite can be had at a reasonable price. There are grades of coal between the anthracite and the bituminous; for example, there is a bituminous coal which has been in the transition state and would have become good anthracite had the conditions remained favorable. This coal looks dull and breaks up more readily than the pure anthracite. It should not cost as much as the genuine hard coal.

Slaty deposit in coal. With nearly all coal-seams there is a slaty deposit. It is often as black as coal, but it splits in thin sheets, and it is not difficult to recognize it among the coals. The housekeeper should always make it a point to examine the first load of coal, to see that it has the right appearance, *i. e.*, that it looks brilliant and is not mixed with this slaty substance.

There are two kinds of anthracite coal—the white ash and the red. The combustion of the red ash is more perfect than that of the white ash. For the range or stoves a mixture of the two is excellent. The red ash generally costs a dollar more a ton than the white. Anthracite coal comes in a variety of sizes—nut, egg, range, grate, furnace, etc.

Size of coal. In selecting coal, the size of the grate or fire-box must be taken into consideration. A small fire-box will require a smaller size of coal than would a large one, and so it is with the grate. If one uses small coal in a grate the bars of which are far apart, there will naturally be a great deal of waste. So, really, one must make the acquaintance of furnace and range before ordering the supply of coal.

Wood, kindling, size, etc. Wood, in the ordinary household, is used more as a kindling than as a regular fuel. When employed as a kindling there should be a mixture of hard and soft wood, well seasoned, cut short, and split rather fine.

When wood is used as a fuel in a stove or fireplace, at least three fourths of the supply should be hard wood. For the fireplace the pieces should be large; for the cooking-stove there should be a mixture of fine and coarse wood. It is always better to have the wood cut too short than the least bit too long.

It is very important that wood should be well seasoned. Green wood throws out very little heat, a great part of the heat being absorbed by the moisture in the wood.

CARE OF THE FURNACE FIRE

All furnaces are constructed on certain general principles. In every furnace, no matter what particular make it may be, there are the hot-air pipes, the chimney-pipe, the damper for chimney-pipe, the check, the drafts in the lower doors, the dust-damper, the water-pan, the fire-pot, and the cold-air box. The housekeeper should acquaint herself with them all at the start.

Construction of furnace.

The shape of the fire-pot is important. A fire-pot that is deep, but small at the top, will not heat a house as well as one that is shallower but has a broader top surface.

The fire-pot.

Cleaning of flues and pipes. Every one of the flues and pipes of the furnace must be cleaned once a year; the spring is the best time for this.

In the autumn, before a fire is built, examine all the pipes carefully. See that the water-pan is filled. Put kindling in the fire-pot. See that all the registers are closed. Open the drafts of the furnace, and burn bits of paper near the smoke-pipe. This will start a current of air upward. Now light the kindling, and put on the wood. After a few minutes put on a layer of coal. When this gets to burning well, add enough coal to make a deep bed.

Method of starting the fire.

Have the registers opened, and open the air-box. As soon as the coal shows that it is getting well ignited, close the drafts and let the fire burn slowly. When the house is warm enough, open the check a little.

This fire will require no more attention until evening, when a little more coal or cinders may be put on, and the damper opened a few minutes to let the gas escape. Close the drafts, and check the fire for the night.

THE MORNING WORK

In looking after the furnace in the morning, the check must first be closed and a thin layer of coal put on. Now take up the ashes that are in the bottom of the furnace. By the time this is done the fire will have burned up. Next open the dust-damper and shake the fire, and with the long poker draw all the clinkers from the bottom of the grate. Then put on a thick bed of fresh coal, and, if you have hods or iron-clad barrels, take up the ashes. Let the fire burn for about ten minutes after the final coal has been put on, and close the smoke-damper, leaving a portion of the slide in the lower door open until the fire has burned up well,—that is, it should begin to look red on the top,—then close the slide.

Renewing the fire.

In extremely cold weather the fire must be shaken down at night, and a good bed of coal put on. It is better to do this in the early part of the evening, so that the house may be comfortable. Sometimes, in very cold weather, it may be necessary to have the slide in the lower door opened a tiny bit. In this case it will be advisable to put on a couple of hodfuls of coal in the middle of the day.

Fire in cold weather.

One should keep old gloves, a cap, and some light, loose overgarment to wear when attending to the furnace.

See "Care of the Range" for explanation of dampers, drafts, and checks.

Fresh air necessary for furnace. The furnace must be supplied with all the fresh air that it can heat. The air enters through the cold-air box, which is opened and closed with a slide which regulates the flow of air. If there is much wind blowing outside, the slide should be only partly open; if, on the other hand, there is little or no wind, the slide should be opened wider.

Regulating supply of cold air. When the air coming through the registers is cool, it shows that more air is coming through the cold-air box than can be heated in the furnace; in this case the slide must be more nearly closed.

When there is a good fire, and yet but little heat is coming through the registers, the supply of air is not sufficient, and the slide of the air-box must be opened.

THE COLD-AIR BOX

When a house is heated by a furnace, the cold-air box is an important adjunct of the heating system.

Importance of cold-air box. It must be remembered that nearly all the warm air that is driven through the pipes must come from out of doors through the cold-air box; part of the air is drawn, also, from the cellar. If the air thus heated and circulated through the house is pure, it follows that the atmosphere must be in a healthful condition, always provided that there is a proper outlet for the foul and exhausted air. If, on the contrary, the air that passes through the cold-air box and the air of the cellar are contaminated, the whole atmosphere of the house will be impure.

Location of cold-air box. The location of the outer opening of the cold-air box, or boxes,—for it is best that there should be one on each of two sides of the house, when possible,—demands most careful attention. No matter where or how the house is built, the cold-air box should be placed only where it may receive uncontaminated

air. It must not open near a drain or cesspool, or near the opening of a sewer. It should be high enough from the ground to avoid the drawing in of damp air. Over the outside opening a fine wire netting should be fastened, and over this a coarser one for the protection of the first. These nettings should be removed occasionally to admit the long brush used in cleaning out the box.

A clean box drawing in pure air means health; a dirty box drawing in dust and impure air means disease.

It seems to me that if one can be sure that the supply of air is pure and the water-box is kept full, the hot-air furnace, taken all in all, gives the purest and most healthful atmosphere to a house.

HEATING-STOVES

The management of fires in stoves used exclusively for heating purposes is practically the same as that of the furnace fire. The fire in a stove should be raked down and the ashes removed in the morning. Fresh coal should be put on, and the drafts and damper kept open long enough for the coal to ignite and the gas to pass off. The stove should then be closed, the damper always left slightly open to allow all gas to pass up the chimney. This precaution of leaving an outlet for the gas is necessary with all stoves, ranges, and furnaces, but with the stove in the living-rooms the greatest possible care must be taken that there is no chance for the escape of gas into the room.

Management of fire.

The air of a room that is heated by a stove becomes very dry. To counteract this, a bowl of water should always stand on top of the stove; ornamental iron vases for this purpose are often supplied with the stove. The bowl or vase should be washed every morning and refilled with fresh water.

Bowl of water on stove.

CARE OF THE RANGE

The coal-range. To get the best possible results from the coal-range it must be treated carefully and intelligently. Each morning all the ashes should be removed, leaving, however, a thin coating on the top of the oven to protect the metal and temper the heat in that place.

Keeping the flues clear. Keep all the flues clear; those under the oven should be cleaned once a month. The fine ashes, that are carried over in the current of hot air that passes around and under the oven, accumulate here, and if not removed frequently will prevent a free circulation of hot air about the oven, which, naturally, will refuse to bake. The ashes, by absorbing heat and impeding circulation, interfere with a proper heating of the oven.

Polishing range. Every morning, after the ashes have been removed and the fire made, all the dust should be brushed from every part of the range; it should then be rubbed off with a damp paper, and the *top* polished with a thin coating of black-lead. Finally the dry blacking-brush should be used to polish every part.

Black-lead should never be put on over dirt, and, indeed, should only be used when the surface has lost its black look. The polishing should be brisk and thorough; if not, the bottoms of the saucepans will become soiled. This never happens when the range is properly polished. Throughout the day, whenever the range becomes soiled, rub it off with a soft newspaper.

Knowledge of drafts and checks. A thorough acquaintance with the drafts and checks is imperative. When the range is free from fire, examine every part of it. Open and close the drafts and checks until you become familiar with their working. Learn the location of the damper that carries heat and smoke directly into the chimney-flue. This is often

called the smoke-damper, which is the term that will be used in this book. It is the most important damper in the range, and the one that causes the most trouble if not properly used.

Learn about oven-flues.

Learn the direction in which a check or damper must be turned for the purpose of opening or closing it.

Acquaint yourself with the air-chambers or flues about the oven.

Examine the grate to see how the contents are dumped and the ashes removed without disturbing the fire.

Learn to make the fire and to regulate it. This may seem difficult at first, but it is a matter that may soon be conquered, if one goes about it patiently and intelligently.

Anthracite coal is one of the most difficult fuels for the beginner to manage; but once having learned its requirements, it will be found one of the most satisfactory and constant of friends. We will begin with the treatment of it. Have all the drafts of the range open and all the checks closed. See that there are no coals, and only a thin layer of ashes, on top of the oven. Have the ash-box under the grate free from ashes and cinders.

How to manage anthracite coal.

Put a layer of paper, lightly crumpled, in the grate. On this lay sticks of kindling-wood, placed crosswise upon each other, so that there may be a current of air through them. On the bed of light wood put a layer of hard wood cut rather fine. Cover the range, and light the paper. Just as soon as the wood begins to burn, which will be in two or three minutes, put on a thin layer of coal, and when this begins to ignite add enough coal to reach within two inches of the top of the fire-box. Close the smoke-damper, but keep the draft at the bottom of the grate open until the fire begins to look red; then close the draft. This fire should do good

To make a fire in range.

work for several hours, when another layer of coal may be put on.

How to manage dampers and checks.

When but little heat is required the drafts may all be closed and some of the checks opened. When the fire is not in use all the checks should be opened. This will keep the fire smoldering for many hours, ready to be brought to a brisk heat by the closing of the checks and the opening of the drafts. By the proper use of the checks and drafts of a range it is possible to increase or diminish the heat at will. An explanation of the checks, dampers, and drafts is necessary here.

The use of the damper.

The *damper* is a flat plate of any shape, which when shut *nearly*—never quite—closes the opening into that part of the range connected with the chimney-flue. When the damper is closed there is a slight drawing of heat through the flue and up the chimney; when it is open the waves of heat go directly over the top of the oven and into the chimney. The combustion of the coal is rapid when this damper is open, and therefore the heat on the top of the range is very great, the lids often getting red-hot. The heat, however, does not linger here; it passes swiftly through the chimney-flue and is lost in the outside atmosphere. When the smoke-damper is open the waves of heat follow the direction of the arrows in Fig. 9.

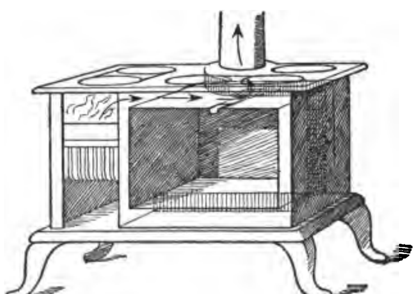

Fig. 9.

Although the coal is now consumed rapidly, and the heat it gives out is intense, it would be impossible to bake in the oven. The top is hot, but the sides and bottom are cool.

This is because the great gate, as it were, is wide open, and the heat rushes out that way instead of going by the long and circuitous route it would take if the gate were closed.

Length of time smoke-damper should be opened.

This damper should be opened only long enough to get the fire thoroughly started. If the chimney has a good draft this will not require more than ten or fifteen minutes.

When the smoke-damper is closed the waves of hot air pass over the oven, down the side, then under it, and up the back to the flue, thus surrounding the oven with a bath of hot air. The following diagram (Fig. 9*a*) shows roughly the course the hot air takes when the smoke-damper is closed. A careful study of the diagrams will teach more about the circulation of the hot air than pages of description could convey. Here we see how the hot air is doing its full duty, owing to the closed damper, and, also, the waste that is caused when the air is allowed to escape by the open damper.

The effect of opening smoke-damper.

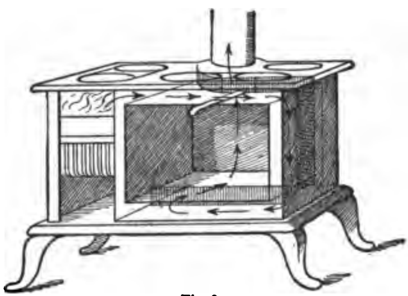

Fig. 9*a*.

The *drafts* are the doors, or slides, which come *below* the fire-box. When they are open a strong current of air passes up through the fire, causing more rapid combustion than when the air finds its way in lesser quantities through cracks and small openings.

Closing smoke-damper heats the oven.

When the *smoke-damper* is *closed* and the *drafts* are *open* the waves of hot air circulate around the oven (see Fig. 9*a*). If it is desired to have the oven very hot, these drafts should be opened wide.

If a baking heat is required, they should be nearly or wholly closed, according, of course, to the thoroughness with which the chimney draws, and to the construction of the range.

How the checks work.

The *checks* are slides in the small door in the front of the range, that is, higher than the fire-box. When these checks are opened, a current of cold air passes *over* the fire and thus retards combustion. Sometimes there is an extra check or damper in the pipe that connects the range with the chimney-flue.

When the checks are *wide open* the combustion of fuel is slight, and the temperature in the oven and on the surface of the range is greatly lowered.

To regulate combustion.

It will be seen from a study of the drafts and checks that the *open drafts* cause the fire to burn rapidly; that the *open checks* retard combustion; that when a hot fire is wanted the *checks are closed* and the *drafts opened;* that to obtain a moderate heat the *drafts* are *partially* or *wholly closed;* that the temperature is *lowered* by *partially opening* the *checks;* and that merely to keep the fire "alive" the *drafts* should be *closed* and the *checks opened* fully.

SOME POINTS TO REMEMBER IN THE TREATMENT OF RANGE FIRES

To lay the fire properly.

1. To have a fire burn freely there must be a free circulation of air through the fuel; therefore wood and coal must be put on lightly and in such a manner that the air can pass freely through the whole bed. Sticks of wood must cross, or partially cross, each other. Coal must never be *packed down,* nor must it reach to the lids, thus preventing a free circulation of air.

To make the fire burn briskly.

2. A current of air *under* the fire causes it to burn; the larger and purer the quantity of air, the more freely the fire burns and the greater the heat.

3. A current of cold air flowing *over* the fire, and the absence of a current of air flowing from the *bottom* up through the fire, cause it to burn slowly and to give out but little heat.

Effects of air flowing *over* or *under* fire.

4. When the large damper leading directly into the flue is opened, the fire burns *rapidly*, and the heat passes over the *top* of the oven, going immediately into the chimney. Therefore this damper, known as the smoke-damper, should be closed as soon as the fire begins to burn, usually not more than ten minutes after the fire has been lighted.

5. When the oven is required very hot, have the drafts open and the checks closed. When a little lower temperature is required, partially close the drafts; to reduce the temperature still lower, wholly close them; when an extremely low temperature is required, open the checks; and, finally, when the fire is not in use, open all the checks. This care of dampers, drafts, and checks will insure a high or low temperature when you desire it. It will save you from tormenting yourself and the fire by continual shaking, poking, and piling on of coal. It will also save valuable time, strength, and material.

To regulate temperature.

6. Keep all the oven-flues free from fine ashes. Empty the ash-pan of the range and replace it *before* you make the fire. Remember that the ashes will absorb a good part of the first heat of the fire.

Removing the ashes.

7. *Never* let the fire burn up to a *white heat*. The coals are exhausted in this way before they have had time to do their work. Watch the fire, and as soon as the coals begin to look red, close the drafts, unless a very hot fire is required at that time. Avoid shaking down the fire, thus packing the coals and cutting off a free passage of air through them. If you do not have a grate that cuts the bottom from the fire, use a poker to remove the ashes from the bottom of the grate.

To prevent fire burning to a white heat.

8. It must be remembered that a bed of coal that is too shallow will not burn; it should be at least seven inches deep; but on no account should the coal come to the top of the fire-box.

Depth of a bed of coal.

9. An anthracite coal fire should not be stirred on the top. Bituminous coal fires often require a little stirring when a hot fire is wanted.

Stirring fires.

10. When one cooks with wood, a bed of clear coals for broiling may be obtained by filling the stove with hard wood, and shutting all the dampers that the wood may burn slowly. The oven will be in good condition for baking with this slow, even fire.

Preparing a wood fire for broiling.

GRATE FIRES

The combustion of the grate fire is regulated by a back damper, and a blower, or "apron."

When the back damper is opened, and the blower or apron in place, the air is drawn under and through the fuel, and passes out by way of the chimney-flue. Under these conditions the combustion is rapid and the heat great, but much of this heat goes up the chimney. Therefore, as soon as the fire is ignited, the blower should be raised and the damper closed. If this is done while the coals are still black on top, you will have a fire that will grow bright and hot gradually, and that will last the greater part of the day.

Use of damper and blower.

The directions given for making the range fire will apply also to the grate fire.

The grate should be kept black, and the hearth clean and bright.

Same directions apply to grate fire.

DON'TS

1. Don't stir a hard-coal fire on the top.
2. Don't pack the coal.

3. Don't let the coal come to the top of the lining of the fire-box.

4. Don't let the ashes remain in the ash-pan to absorb the heat.

TO REMOVE CLINKERS

When clinkers adhere to the lining of the fire-box, they may be easily removed. Put a thick bed of oyster- or clam-shells on the red-hot fire. The heat converts the shells into quicklime, which loosens the clinkers. If the shells are not to be had, put a few pounds of quicklime on the fire. In the morning, when the cinders and ashes are removed, the clinkers may be detached from the lining by a few light blows of the poker. If any still adhere, do not use force, but try the shells or lime again the next day.

The reason why there are clinkers at all in the range is because the fire has been allowed to burn up to a white heat. Proper attention to the fire, and a care to remove all substances from the lining of the fire-box every morning, thus keeping it smooth, will prevent this annoyance.

CHAPTER VIII

TABLE SERVICE

General arrangements of the table. The breakfast-table. The dinner-table. The luncheon-table. The tea-table. Waiting on the table. Ceremonious entertaining. Some points on table etiquette. The duties of the waitress. Protecting the table from hot dishes.

On the proper table service much of the comfort, cheerfulness, and refinement of the family depend. No amount of lavishness and perfection in the preparation of the food will compensate for poor arrangements and service in the dining-room. The most perfect order, and yet the greatest freedom, should exist. Table manners and service are an excellent gage of the refinement of a family and of a people.

There are certain definite rules which should be followed in all households, from the very simplest to the most sumptuous. Then, there are unwritten laws of good breeding which will naturally lead people of innate refinement to be careful, in act and speech, to do nothing at table which could give offense to the most fastidious.

Unwritten laws of good breeding.

It is the duty of every one to do his or her part to make the time passed at table as bright and full of cheer as possible. The worry, haste, lack of conversation, and often the ill temper shown at table have much to do with the national disease known as dyspepsia.

The dining-room should be well lighted and well ventilated. The chairs should be comfortable, with backs that are almost straight, and they should be absolutely firm and strong. The table should be broad; it is nearly impossible to arrange a narrow table elegantly.

Light and ventilation.

No matter what the style of living may be,—and this applies to the simplest as well as the most elaborate households,—there should always be a care to make the table and food pleasing to the eye. Well-laundered table-linen, tableware that has been properly washed and wiped and that is arranged in an orderly manner, are the strongest factors in making a table elegant and attractive. A few flowers loosely arranged, a bunch of ferns, or a small plant or fern will adorn and brighten a table more than any other one thing that can be used. Such decorations are in place on the humblest or the most sumptuous tables.

The table should always be made attractive.

The table-linen should be of as fine a quality as one's purse will allow. The oftener a good piece of linen is laundered, the more beautiful it grows, so that a good material is always cheap in the end. If the table-linen is of a fine, heavy quality, it should not be starched. If, however, it is thin, it will require a *very little* starch to give it body. (See "Table-linen," under "Laundry.")

Table-linen must be well laundered.

It would be impossible to give rules for table service that would apply to all families, but there are certain fundamental principles which must be observed in any well-ordered home. In the sections on the "General Arrangements of the Table," "Waiting on the Table," and "The Duties of the Waitress" these principles are embodied. When one has made herself mistress of these methods, it is not a difficult matter to enlarge upon or abbreviate the table service, as special occasions and one's manner of living may demand.

Ceremonious occasions call for special service; the sections on company dinners, luncheons,

Special service.

suppers, etc., will aid the housekeeper in mapping out such entertainments.

It must never be forgotten that the personality of the mistress of the house should be felt in all the appointments of her table, both in the intimacy of her family, and on the more formal occasions when she entertains her friends.

The personality of the mistress.

Certain rules that are understood and observed by all well-bred people, the world over, cannot be changed; but decorations and the minor services should have a distinct individuality.

GENERAL ARRANGEMENTS OF THE TABLE

As far as it relates to the table, there is one point in the dining-room that may be regarded as the center. The chandelier is usually this point. The center of the table should come exactly under the center of the chandelier.

Laying the cloth.

The first proceeding in the laying of the table is the placing of the thick cloth, either felt, double Canton flannel, or one of the many thick materials that are made for this purpose. When this under-cloth is smoothly in place, spread the linen cloth over it, taking care to have the crease in the middle of the cloth come exactly in the middle of the table, and crossing the crease of the cross-fold precisely at the center. The lines of the table being true, next put the plates in position. If you cannot measure accurately with your eye, use a yardstick to determine the distance between the plates, which should be at least twenty inches. When the plates are correctly placed it will be easy to arrange the table symmetrically. The center ornament should next be put in place, and after that the silver and glass.

Placing of the plates.

Place knives and spoons at the right of the plate, having the ends of the handles near the edge of the table, the sharp

edge of the knives toward the plate, and the inside of the bowls of the spoons turned up. The forks should be at the left side of the plate, with the inside turned up. Place the glasses at the right of the plate, the water-glass just coming to the point of the knife. If carving-cloths are used, arrange them before the plates are put on the table. Fresh napkins may be put on the plates, or at the left-hand side of the plates; the napkins in rings go at the side of the plates.

Knives, forks, and glasses.

Napkins.

Individual salt-cellars are the most satisfactory, provided there are small spoons to go with them. In any case, whether individual or large salt-cellars are used, there must be a small spoon for each salt-cellar. The individual salt-cellars are placed at the top of the plates, the large ones at the corners of the table, or at the sides, where they may be within reach of several people. It is a saving of time for the waitress if water carafes are used. There should be one carafe to every three or four people. A bowl of crushed ice, if ice is served, and a spoon should be placed near the carafe.

Salt-cellars.

THE BREAKFAST-TABLE

The arrangement of the breakfast-table is after the general plan already given. If fruit and mush are served, there should be a fruit-knife and teaspoon at the side of each plate with the knife. Finger-bowls and fruit-doilies should always be provided when fruit is served.

The arrangement of the breakfast-table.

Warm dishes for the mush, and a tablespoon with which to serve it, may be set before a member of the family.

Cups and saucers, sugar, cream, and rests for the hot coffee and milk, should be placed in front of the mistress of the house. Knife, fork, and spoons may be placed at the head of the table for serving the substantial dishes, and

small butter-plates and butter-knife may be set near the butter-dish. If there should be griddle-cakes, waffles, or fried mush, an extra set of knives, forks, and hot plates must be ready for this course.

THE DINNER-TABLE

In preparing the table for dinner follow the general directions for arranging the table. The carving-set and knife-and-fork rests may be laid at the carver's place; the soup-ladle goes at the place of the mistress.

Oil and vinegar bottles should be placed on small doilies at one side of the table, or, when the service is ample, they may be brought to the table when needed.

The dishes for the various courses must be arranged in the pantry or on the sideboard. The bread for this meal may be laid in the fold of the napkin, or passed when the soup is served, or, if the service is limited, the plate of bread may be placed on the table.

THE LUNCHEON-TABLE

The arrangement of this table is practically the same as already given in the general directions, with the addition of the proper articles for serving the food appropriate to this meal.

THE TEA-TABLE

The tea-table should be attractive.

The tea-table should be bright and cheery. For this meal dainty china and sparkling glass and silver are specially desirable. All the articles for making and serving the tea should be placed beside the plate of the mistress. This includes tea-cups and saucers, sugar, cream, tea-pot, hot-water pot, and slop-bowl. If the tea is to be made at the table, the tea-kettle,

filled with boiling water, should be in place, and the lamp under it should be lighted just as the family sit down to the table.

The substantial dish, be it hot or cold, should be placed at the end of the table, opposite the tea service. As this meal usually consists of tea, bread and butter, cold meat or some hot relish, cake and some form of cooked or preserved fruit, the food may be placed on the table before the family take their places. When the usual tea is replaced by a hot supper, it is necessary to have warm plates, and to change the plates when the sweets are served.

Arrangement and serving of the food.

WAITING ON THE TABLE

The waitress should stand at the back of the mistress, or while the meat is being carved at the back of the carver. She should take each plate, as it is ready to serve, in her right hand, and place it before the person for whom it is intended.

Position of waitress.

If vegetables or a sauce are to be served with the meat, they should follow as quickly as possible, the waitress passing the dishes on a tray, or holding them in her hands. She must go to the left side of the person served, and hold the dishes so low that one can serve one's self with ease.

How the waitress shall serve dishes.

Everything is served at the left, except water and other liquids that must be poured into a glass. All soiled dishes should be removed from the left. Sometimes this is done from the right.

The plate of soup, fish, meat, etc., should be *placed* in front of the person served, not held for him to take. The waitress should hold all large dishes in her hands, and pass small ones on a tray.

At a dinner or luncheon, before serving the dessert,

everything except the glasses, olives, confectionery, and fruit must be removed, and the table must be brushed free from crumbs. The best implements for doing this are a small tray, and a broad-bladed knife like a fish-knife. This knife should be used gently and lightly, so as not to injure the texture of the fine damask. Pieces of bread, or any fragments that may have fallen on the table, are to be lifted with this knife and put on the tray.

What shall be removed.

The waitress should never pile one dish upon another.

When one has finished a course, the knife, fork, or spoon should be placed in the center of the plate. If two pieces of silver have been used, they should be placed side by side upon the plate, not at an angle to each other, that there may be no danger of accidents when the plate is lifted. The waitress should not attempt to take more than two such plates at a time. The large dishes should be carried out in the hands. Small dishes may be placed on a tray and thus carried out, but they should never be piled one upon the other. Unless the carver is careful to place the carving-knife and -fork in a secure position, it is best to avoid all possibility of accidents by removing them on the tray.

Position of knife, fork, and spoon when one has finished.

Dishes should not be piled one on another.

In order to make the various changes quickly, it will be found a great convenience to have a large table in the pantry off the dining-room, where the dishes may be placed as they are removed from the table. If there is a second person here, who can sort the dishes and put them aside as rapidly as they are brought out, matters will be much simplified.

CEREMONIOUS ENTERTAINING

When entertaining ceremoniously, the hostess has many things to consider. If your friends drop in unexpectedly, or

come frequently and without ceremony, it is true hospitality to give a cordial welcome and share with them that which was provided for your own family. A considerate person would feel very uncomfortable if he felt or knew that his hostess had been incommoded by his arrival. When one sets a time for entertaining one's friends it is another case. From the time your guest enters your house until he departs you are responsible for his comfort and happiness, and by your forethought and care everything that can be done toward that end should be done.

Ease of manner and forethought on the part of hostess an evidence of true hospitality.

The first consideration is the selection of your guests. They must be people who are congenial to each other, or, if there are strangers, care must be taken that they are all people whom you have reason to think would be congenial.

Care in selection of guests that they may be congenial.

Having settled upon your guests, your next step is to provide the best entertainment that your *means* and *style of living* will permit. Nothing can be in worse taste than to attempt to entertain in the same manner in which your friends entertain, if they are richer or poorer than yourself.

Never attempt more than you can do well with the appliances and help at your command. A simple dinner of three courses, where everything is of the best quality, perfectly cooked and served, and where the hostess is at her ease, is more likely to be a success than an elaborate dinner, badly prepared and served, with a hostess distrait and embarrassed. Of course, if money is no consideration, and one has a well-equipped household, entertaining may be an easy matter for the hostess, if she has the true spirit of hospitality, and understands how to select her guests and control her forces. For the woman with but one servant, or the one who does her own work and who must make every dollar count, it is

To be a success a dinner must be well served.

another matter. At the same time, this latter class should not deprive themselves and their friends of one of the most delightful pleasures of domestic life. If such women will make it a rule to entertain simply and in accordance with their purses and mode of life, they will give and receive a great deal of pleasure.

People of moderate means may entertain simply and well with limited service.

Fashion changes in the manner of dinner-giving, as in everything else. Formerly the company dinner was, with its numerous courses and long hours at table, a thing to be dreaded as much by the guest as by the hostess. To-day the dinner is much simpler, and generally much more successful as a gastronomic and social affair.

In this country the order of a simple company dinner is about as follows. The first course is oysters or clams on the half-shell, or *canapés* of sardines, caviar, or some other light relish; or the dinner may begin with the soup. This is followed by the fish, with which a sauce is served, and, of course, bread. Some hostesses serve potato in some form with this course.

Proper succession of courses.

The next course, *relevé*, may be either a joint of butcher meat or poultry, roasted, boiled, or broiled, and one vegetable. If the fish was boiled or baked, and served with a sauce, the relevé may be omitted, and the entrée come next. Following the entrée may come a water-ice, half frozen, or a cheese course or vegetable course. After this course, roast or broiled poultry or game, with a salad which is to be eaten with it, is served. The salad may be of lettuce, sorrel, chicory, cresses, etc., with French dressing, or it may be of crisp white celery with mayonnaise dressing. Some light, cold, sweet dish may form the dessert. The dinner should be finished with small cups of strong black coffee, which may be served in the dining-room or in the drawing-room. Cream and sugar should be passed with the coffee. This would be considered by many dinner-givers as too simple an

entertainment; but if it is well cooked and served it will be an elegant and satisfactory one.

The dinner is usually given at night, and it must be remembered that the lights, guests, and attendants soon exhaust the oxygen of the air, therefore the ventilation of the dining-room must be carefully attended to, and it must be seen that no one is exposed to a draft. The heating apparatus, too, must be regulated; the amount of heat coming into the room should be diminished after the guests are seated. An overheated room and bad air will make a failure of the finest dinner.

Importance of good ventilation during a dinner. Room must not be too warm.

A synopsis of the method of serving the dinner may be helpful to the beginner.

Synopsis of method of serving dinner.

1. Raw oysters, or other *hors-d'œuvre*, are served on special or small plates, which are placed in the plate already before the guest.
2. Oyster-plates removed, and soup placed before each guest.
3. Soup-plates removed.
4. Plate with fish placed before each guest.

In serving each course, the waitress removes the empty plate of the previous course with the left hand, and places the plate for the succeeding course with the right hand.

The sauce, if not served with the fish, is passed; also the vegetable, if there is one.

5. Fish-plate removed, and the relevé served, sauce and vegetable being passed.
6. Cheese course, or half-frozen ice served in glasses.
7. Roast or broiled game or poultry, with dressed green salad. If one wishes a vegetable, that may be served here also, or the vegetable may follow in a course by itself.
8. Brush the table, and serve the dessert.
9. Serve the coffee. Some hostesses have the coffee served in the drawing-room.

If fruit is served, there must be fruit-knives and -napkins. Many hostesses do not have finger-bowls brought to the table unless fruit has been served.

Fruit-knives and -napkins, also finger-bowls.

No food that will leave a pronounced odor on the hands, as celery, for example, should be served at a ceremonious dinner. Bread should be supplied to the guests from the beginning of the dinner to the dessert.

No food which will leave odor upon the hands.

Bread served throughout the dinner.

The custom of serving cheese with crisp bread, like pulled bread, for example, or crackers, as a last course is very much in favor with some dinner-givers. The crackers or bread should be crisp and fresh and the cheese the best of its kind.

SOME POINTS ON TABLE ETIQUETTE

The proper attitude at the table is an erect one; there should be no leaning against the back of the chair; neither should one rest one's arms on the table nor crowd or incommode one's neighbor.

Attitude at table.

Avoid making a noise in masticating your food or in drinking.

When a dish is handed around, serve yourself promptly and with a care not to mar the appearance of the food.

When asked your preference as to the portion of the joint, answer at once, and, if you have one, express your preference. There is nothing more annoying to a carver than to have to wait while some one deliberates as to his choice in this matter. Whenever possible, one should be content with what has been served him. At the family table it is perfectly proper to ask that too rare or too well done a piece of meat be changed for one better done or more rare, as the case may be, and it is the duty of whoever serves the food to ascertain the tastes of each individual, and, as far as he is able, to satisfy them. On the other hand, each member of the

Acceptance of food as it is served.

family should cultivate a habit of consideration and appreciation, and not be too capricious or exacting. There are people who invariably come to the table in a critical and fault-finding mood, often refusing the food at the home table that they compliment at the table of a friend or order at a hotel or restaurant. These thoughtless fault-finders can never estimate the amount of mental discomfort they inflict upon those that are dearest to them, or the burden of extra labor they put upon the shoulders of mother, wife, or maid.

Annoyance of fault-finding at table.

When a plate is sent back for a second portion, care should be taken to place the knife and fork, or spoon, straight on the plate, and a little to one side, so that there may be no danger of their slipping off, and a part of the plate shall be ready to receive the food. If, as is the case in some houses, there is a knife-rest beside each plate, let the tips of the knife and fork rest on this, and send the free plate to the server.

Position of knife and fork on plate.

One should be careful not to eat so rapidly that the food may not be properly masticated, or that one will have finished while the others at the table are still eating.

Meals should be eaten slowly.

If it is necessary to ask for anything during a meal, one should take the opportunity of speaking quietly to the waitress when she is near, or wait until it is possible to catch her eye.

Mode of speaking to waitress.

When a meal is announced, go to the table promptly. It is annoying to the housekeeper and cook to have the meals delayed. It often happens that a few minutes' waiting may spoil some dish, and, in any case, it causes a waste of precious time to the housekeeper and other members of the family. Some thoughtless people seem to think that it matters less that the whole family is kept waiting five minutes or more than that they should complete the work

Promptness in obeying summons to meals.

which they happen to have in hand. There are many jars and breaks in the household machinery from this cause alone.

In many households where there is a regular waitress there is a rule sometimes that nothing shall be handed by members of the family; while in other homes, even where there is plenty of service, each member of the family has a watchful care of the needs of the other persons at the table. In the second case the atmosphere is more sociable and friendly, and in family life this care for the wants and comfort of others tends to develop some of the most desirable traits of character, courtesy, and unselfishness. A certain amount of ceremony should always be observed, even at the simplest family meal; but when this is carried too far it crushes sociability and cheerfulness.

Members of the household exercising watchful care at table adds to social element.

Form of offering service at table.

In offering to serve any one at the table use one of these forms: "May I help you," "May I offer [or "send"] you," "Let me give you," etc. "Will you have," is a form that should be used only by the waitress.

The mistress of the house usually pours the tea and coffee. She should always ask if her guests take sugar and cream. To the minds of many people the flavor of the tea or coffee is much improved if the hot beverage is poured on the cream and sugar. The hostess must be careful to inquire just how much sugar and cream the guest takes, and he should be equally careful to state the amount. The sugar and cream should be handed with the beverage, so that each one may add more, if he desires. These little matters are necessary, because upon them depends the perfection of his cup of tea or coffee, a consideration by no means unimportant to the habitual tea- or coffee-drinker.

Pouring tea or coffee.

Upon little matters depend perfection.

The spoon should never be left in the cup. The knife and fork should be placed straight on the plate after using, and side by side. Toothpicks, like tooth-brushes, should be used only in the privacy of one's room. It is extremely important that children should be well trained in all these little points, since the habits of youth are apt to follow one through life.

How one should leave knife, fork, and spoon. ***Where a toothpick should be used.***

THE DUTIES OF THE WAITRESS

The personal appearance of the waitress requires special attention. She should not be too large or too old. She should be trim in her appearance, quiet in manner, and light of foot. Her dress should always be clean and well fitting, and her apron, collar, and cuffs spotless.

Personal appearance and dress of the waitress.

Fashion at present decrees that the waitress should wear a black dress, white collar and cuffs, a white apron, and a small white cap. In many well-regulated households, however, the waitress wears a light print dress, a fashion which must always commend itself, because it means freshness and cleanliness. The waitress should wear boots with soft soles, or slippers, that she may move about the dining-room noiselessly.

She should understand her duties so well, and be so attentive to the wants of the family, that it should not be necessary to ask for anything during a meal, unless a special taste that could not ordinarily have been anticipated is to be gratified.

The attention of waitress.

During a ceremonious dinner or luncheon it is particularly important that all the service should be rendered without a word being exchanged between mistress and maid. This can be accomplished only by seeing that the maid has a clear understanding of all that is required, and that she is watch-

ful of each guest. If she is in the daily habit of discharging these duties carefully, she will be in proper training for the more formal occasions. It takes constant practice to arrive at perfection.

Regular duties of waitress. The regular duties of the waitress, as they relate to the dining-room and its accessories, are quite varied.

The waitress sharpens the carving-knives.

Announcing meals. When a meal is ready she announces it. The method of making this announcement varies with the habits of the family and the style of living. If it is the custom of the family to gather in the living-room or drawing-room before each meal, the waitress comes to the door, and, addressing the mistress of the house, says, "Dinner" (or whatever the meal may be) "is served." When the family is large and scattered at meal-times, and the service is limited, the meal is announced by means of a bell or gong. In this case the bell or gong should be as musical as possible.

The other duties of the waitress may be enumerated as follows:

Preparations for breakfast.

1. Before breakfast she should air and dust the dining-room, and if there is an open fire there she should make that, brushing and washing the hearth.
2. She should then place the plates and serving-dishes to warm.
3. Set the table.
4. Prepare the butter, cut the bread, draw the cold water, and place the breakfast on the table. If, as is the case in most families, she is not required after the coffee and substantial part of the meal have been served, she may leave the dining-room and attend to other duties.

If but two maids are kept, the waitress then goes up-stairs and puts the beds and sleeping-rooms to air. After this her own breakfast will be ready.

5. When the family meal is finished the table should be cleared in this manner: Have a tray on which to gather all the silver and knives, care being taken to keep the silver separate from the steel knives. In the pantry put the knives in a pitcher of water,—the water must not reach the handles,—and the silver in a similar pitcher of water. There are pitchers that come in tin for this purpose. Place all the small articles on the tray, carry them into the pantry, and sort the dishes, rinsing them off under the cold-water faucet. Pile them, each with its own kind, on one part of the table. Fill empty milk and cream pitchers with cold water, and set them aside to soak.

Preparation for washing dishes.

6. Return to the dining-room and brush the crumbs from the table-cloth. Remove the cloth and fold it, being careful to lay the folds in the old creases. Do this as carefully as possible, so as not to wrinkle the cloth. Put away the table-cloth and napkins. Dust and air the dining-room.

Setting dining-room in order.

7. Go back to the pantry and wash the dishes as directed under "Care of Tableware." As soon as the milk and cream pitchers are washed, fill them with boiling water, and let them stand until all the work in the pantry is finished.

Washing breakfast dishes.

8. Wipe the pantry shelves, and examine the receptacles in which bread, cake, sugar, etc., are kept. See that they are clean and that the food is in good condition. Make a list of articles that are needed. Wash the tables, sink, dish-pans, towels, and dish-cloth, and hang the towels and dish-cloth out to dry. Sweep the pantry floor, and if there are any soiled places on it, wipe them with a cloth wrung out of hot water, wiping with a dry cloth.

Setting the pantry in order.

9. The noonday meal, whether it is luncheon or dinner, will require warm dishes. The dishes to be warmed should be put in the heater at least half an hour before

The noonday meal.

serving the meal. The waitress should see that the dining-room is properly heated in winter, and that the shades are arranged to make a pleasant light. The table should be set, the bread, butter, and water prepared, and the meal served on time. If there are to be salads, cheese, fruit, etc., for this meal, the waitress usually prepares them. She also has charge of the pickles, olives, sardines, potted meats, fruits, and similar dainties.

10. Dinner, as a rule, comes in the evening, and requires special care on the part of the cook and waitress. Warm dishes for the hot food and cold dishes for the cold food are invariably needed for this meal. It is of the greatest importance that the waitress should understand the necessity of serving hot food on well-warmed plates, and cold food on absolutely cold plates. A cold plate will quickly absorb the heat from soup, sauce, meat, or fish, while a warm plate, by imparting its own heat, will ruin a food that should be served cold. At the same time, care must be taken to avoid going to the extreme of having the plates so hot that they are difficult to handle or will mar the surface of the table.

Hot plates and cold plates.

The bread for dinner is cut thick. If the loaf is a square one, the slices are divided into two or four parts, according to the size of the loaf. Slices from the round French loaf are not subdivided. Bread for the other meals should be cut in *thin* slices.

Bread for dinner.

Since the duties of the waitress vary with the habits and circumstances of the family, I have attempted to give only such duties, and the methods of performing them, as are a part of the work of a trained butler or waitress, but which form part of the work that any general housemaid is often required to do. If the maid is thoroughly trained in the duties here outlined, it will be an easy matter for either mistress or maid to extend or reduce them.

The services of the waitress vary with mode of living.

The waitress is made responsible for the silver, glass, and china, and she is expected to keep them clean and intact. To do this she must have proper appliances. There must be a place for everything, and everything must be kept in its place. Ample closet-room should be provided, that there may be no need of crowding the china, etc., or of piling a great many delicate dishes one upon another. There should be tables in the pantry, so that when the dining-table is being cleared it will not be difficult to dispose of the dishes. The sink must be so broad and the water-faucets so high that there shall be no danger of striking the dishes against the projecting faucets. If the sink is narrow and the faucets low, there should be a large tray of galvanized iron, which should be placed on a table, to hold the dish-pan. This precaution will be found to lessen greatly the danger of breakage. Having plenty of hot water, soap, and towels, and all other appliances, the waitress must do her part to protect the tableware, etc., committed to her charge. She should always observe the following rules:

She should be responsible for silver, glass, and china.

Rules to be observed.

1. The water into which the glass or china is put *first* must not be too hot.

2. A few pieces only must be put in the pan at a time, and heavy pieces should never be placed on small or delicate ones.

3. Each piece should be wiped with care, and pressure on fragile articles of glass or china should be avoided.

4. Care should be taken that no sharp, hard substance, like a grain of sand, is on the table or dish-cloth, or in the dish-pan.

5. Delicate glass and china must not be exposed to extremes of heat or cold; as, for instance, a hot substance should not be put in a cold dish, or a cold substance, like a frozen mixture, must not be put into a dish that has not been gradually chilled.

A scrupulous observance of these little points will save a world of trouble and expense.

PROTECTING THE TABLE FROM HOT DISHES

Food that should be served hot requires warm plates and serving-dishes, that it may lose none of its heat while being served and eaten. The serving-dish should be a little warmer than the plates.

Flannel under covers.

As heat mars varnished and other polished surfaces, the table must be protected by some substance that will prevent it from being reached by heat. The thick covers that are placed under the table-cloth are usually made of cotton, a material which is not a good non-conductor of heat. If, instead of this kind of cover, one of thick flannel is used, the chances of excessive heat passing through to the table would be greatly diminished. I should advise a thick flannel cover for a handsomely polished table-top.

Mats and tiles.

Thick mats placed under platters and other hot dishes are a protection. Tiles are often used for this purpose, but they absorb the heat from the dish and transmit it to the table. If, however, the tiles are set on little feet, or are in a frame which raises them from the table, they are a sufficient protection. Tiles are not satisfactory supports for a platter on which the joint, or any other piece that is to be carved, rests, as the dish is apt to slip about on the glazed surface. A thin pad of flannel may be covered with a linen slip and placed under the carving-cloth.

Supports for tea- and coffee-pots.

For coffee-pots, tea-pots, hot water, etc., there should be a broad tile or a slightly raised wire frame. On this place a thin flannel pad covered with a linen slip. The flannel is necessary between the tile or wire frame, as it conserves the heat in the vessel set upon it. If, for example, the tea- or coffee-pot is placed directly on the cold tile, it parts with its heat rapidly, so that

in protecting the polish of one's table one must not lose sight of the fact that a beautifully polished surface is a costly luxury indeed if, for the sake of preserving it, one's food and drink may never be kept at a proper temperature. But with the pads of non-conducting material, and with tiles or some other supports that are raised sufficiently to allow a current of air to pass between them and the table, food may be kept hot and the polish of the table preserved at the same time.

CHAPTER IX

MARKETING

The muscular system. Some characteristics of the muscular flesh of animals. The minor parts of the animal. Game and poultry. Care and purchase of general supplies.

Aim of this chapter.

This subject is so comprehensive that a whole volume would hardly cover it; therefore in one short chapter there must be many things that are not even touched upon. The housekeeper needs clear, concise explanations of the best methods of identifying the materials that enter into the daily menu, and this has been attempted in this chapter.

In most households the item of butchers' meat is often much heavier than it need be, because of ignorance on the part of the housekeeper. Every woman whose place is at the head of a house should know, at least, where the different cuts come from, both tender and tough, what proportion of bone there is to meat, why the quality varies in different sections of the animal, what treatment the different cuts should receive, etc. Once having learned this, the housekeeper will order intelligently and get most satisfactory results.

How to acquire a knowledge of marketing.

It is not possible to learn from books all that one should know on this subject, but with study at home, and frequent visits to the market, any woman may in time master this important branch

of household economy. The intelligent butcher is always glad to aid his customers in acquiring this knowledge, for it is to his advantage as well as to theirs. The intelligent and just customer knows what she wants, and appreciates good service, while the woman who has no knowledge of the subject is more difficult to serve.

Danger of attempting to learn too much at once.

One should not attempt to learn too much at once; confusion of ideas and discouragement will be the result of such a course. If the beginner will carry out the following program she will have a comprehensive knowledge of the subject at the end of six months.

1. Study the anatomy of the animal so as to know how to locate all the bones. (See Fig. 10.)

Program of method of study.

2. Study the muscular system, that the position of the muscles and tendons may be clear in the mind. This will help to an understanding of how the meat should be cut so that the slices shall be across the grain. (See Fig. 14.)

3. Study the change of position of bones and muscles in the hind quarter, as shown in Figs. 15 and 16.

4. Become familiar with the interior of a side of beef (Fig. 17), noting the position of the spine, ribs, sternum, kidney, suet, and tenderloin.

5. Study the outline of the outside of the side of beef (Fig. 18), the position of each cut, and its relation to the bones of the skeleton. Look at Fig. 14, and from that locate in each cut the direction in which the muscles run.

Color, odor, and texture learned by observation and experience.

One should become familiar with the texture and color while studying the bones and muscles of the animal. There are certain things that can be learned only by personal observation. For example, one judges of the freshness of fish by the color, texture, and odor; but an inexperienced person finds it difficult to distinguish between a fresh and a stale

odor, and who can describe it? So it is in countless little points in which observation and experience are the best teachers, therefore make frequent visits to the market.

The ox used to illustrate muscular system and anatomy of the animals from which we get butchers' meat.

The ox has been taken to illustrate the anatomy and muscular system of the animal, but all the other animals from which we get butchers' meat are constructed on the same plan. The smaller animals are not divided into so many parts, and the immature animals, like veal and lamb, have less fat and hard bone, but more cartilage; therefore some portions that are tough in the mature animal are tender in the immature animal. Hence certain joints that, when taken from beef or mutton, require cooking slowly for a long time to make them tender, may, when taken from lamb or veal, be cooked by the quicker methods, such as roasting or broiling. Take, for example, the neck or breast of any animal. To save confusion by a multiplicity of diagrams, a side of mutton has been taken to illustrate the methods of cutting the smaller animals. (See Fig. 24.)

The quality of meat depends upon many things—the age, breed, etc., of the animal, the amount of exercise, the kind of food, the mode of dressing, and the time given to ripening.

Beef.—The ox, steer, heifer, and cow yield the meat known as beef. These animals are dressed at the source of supply,

What is known as Chicago-dressed beef.

or are sent alive to the local markets, in well-ventilated and watered cars, where they are dressed. In the last fifteen or twenty years there have been great changes in the manner of supplying the markets with beef. Previous to that time it was nearly all dressed in the locality in which it was sold. This meant for the cattle long, exhaustive journeys in crowded cars. Now the greater part of the beef is dressed near the source which supplies the cattle, and it goes by the name of Chicago-dressed beef.

At the outset this method of supplying the market met with opposition. Naturally, while in an experimental stage many mistakes were made. The beef was often packed in the refrigerators before all the animal heat had passed off, and, as a consequence, when it reached the Eastern market it had acquired a peculiar and disagreeable taste. Sometimes other preservatives than cold were employed. All this has been changed, and now one cannot ask for anything better than a joint from a prime Chicago-dressed animal.

At these large establishments they have the best appliances for doing the work in the quickest, most painless and sanitary manner. They also have methods for utilizing the tougher and less sought after portions of the animal, sending East the most marketable portions. This gives a different-looking side from that of the home-dressed beef, there being less flank and often no neck; but in the final cutting into joints there is practically no difference from the home-dressed.

Quality of beef depends upon age of the animal and how it has been fed.

The quality of beef, as of all kinds of meat, depends upon the age of the animal and how fed. Butchers consider that the age between four and eight years gives the best beef. In former years none but "stall-fed beef"—*i. e.*, an animal that was kept for months in the barn and fed largely on grain—was considered prime. This is practically true now. The flesh is made rapidly, and is shorter grained and more tender than the grass-fed animal; yet there can be no doubt but that a combination of the two methods will give a healthier meat, for while the exercise in the open air tends to toughen the muscles, it also makes them more healthy and of a finer flavor. It is true of all animals that little exercise and generous feeding with grain produce tender flesh, which grows plump in cooking.

Beef should hang until well ripened—not less than three weeks, longer when possible.

Good beef will be firm, fine-grained, the color when first cut a purplish red, but on exposure to the air for a few minutes becoming a bright red. If the beef is well ripened it will have a moist, juicy appearance. When first killed, the tiny globules of moisture are absent on the fresh-cut surface. The fat should be a light straw-color; the kidney suet should be white, firm, dry, and crumbly. In a prime animal there is a generous layer of fat on the back, shoulders, and sides, and fine particles of fat distributed through the muscles; the bones will be small in proportion to the meat.

Indications of good beef.

The fat of poor beef is a dark yellow, the suet oily, tough, and fibrous. The lean is coarse, open-grained and flabby, and often quite dark.

Some indications of poor beef.

How the carcass is divided.

The beef being the largest animal that the butcher handles, it is cut into more joints than is the carcass of any other animal. It is first split the length of the backbone (spine), thus dividing the carcass into two parts. These are divided into hind quarters and fore quarters—the loin, rump, round, leg, and flank going on the hind quarter, and ribs, shoulder, brisket, cross-ribs, etc., going on the fore quarter; these quarters are again subdivided.

The division into quarters is practically the same all over the country, but the subdivision varies in different sections. The New York method is followed nearly all over the country, except in some parts of New England and Pennsylvania. When once the anatomy of the animal and the muscular system is understood, a knowledge of the various cuts and their uses may be acquired readily.

THE MUSCULAR SYSTEM

The skeleton is covered with a thick layer of muscular fibers; this is known as lean beef. These muscles are the

active organs of movement. There is not a movement of the body, no matter how slight, that does not require the aid of one or more sets of muscles. The more active they are, the more freely the blood flows through them, and, as a consequence, they are healthier than when not exercised. But with exercise they become firmer and harder. This is seen, for example, in the beef. The legs, sides, shoulders, and neck are exercised more than the back and the tenderloin, and are therefore tougher, but also more highly flavored and more nutritious, than the tender and less-exercised parts.

Effect of exercise on muscle.

A knowledge of the structure of the muscular fibers will be valuable in buying, carving, and cooking meats.

These muscles are composed of bundles of hundreds of slender threads, called fibrils, held together by connective tissue. These little bundles of fibrils are massed together to form ultimate fibers. The ultimate fibers are sheathed by connective tissue. Bundles of ultimate fiber are, in their turn, massed together and sheathed in connective tissue to form fasciculi. The fasciculi are bound together to form what is known as lean meat or muscular fiber. It will be seen from the foregoing that in lean meat there are three sets of bundles, each set sheathed in a thin membranous substance called connective tissue.

The value of a knowledge of the structure of muscular fiber.

When lean meat is cooked a long time at the proper temperature this connective tissue is gelatinized and holds the lean fibers together in a solid, tender, juicy mass. If, on the contrary, the meat is cooked at too high a temperature, the connective tissue will be destroyed, and the pieces of meat will separate into long, tough, thread-like fibers. In the chapter on cooking albuminous substances the principles underlying the cooking of lean meats are fully

The effects of different degrees of heat on muscular fiber.

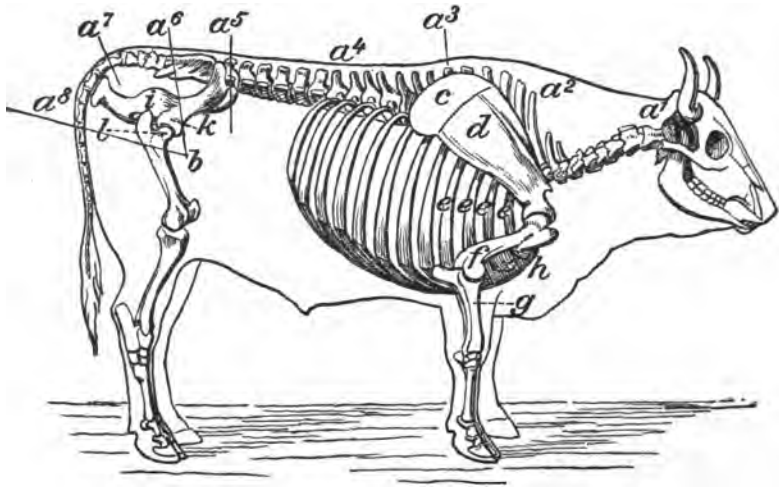

Fig. 10. Location of the Bones in the Various Cuts of Meat.

a^1 to a^2, neck; a^2 to a^3, six chuck ribs; a^3 to a^4, seven prime ribs; a^4 to a^5, loin or porterhouse; a^5 to a^6, thick or hip sirloin; a^6 to a^8, rump piece; a^7, where rump is divided into top and tail end; *c*, *d*, shoulder-blade; *e*, *e*, *e*, *e*, cross-rib piece; *f*, *g*, bones in shoulder of beef; *h*, sternum; *i*, head of thigh-bone; *k*, socket; *l*, ball,

treated. No woman can afford to be ignorant on a subject on which depends so much economy or waste.

Below are cuts of muscular fiber. Fig. 11 shows the arrangement in bundles; Fig. 12, the fiber partially separated into fibrils; Fig. 13, the fiber cut across the grain.

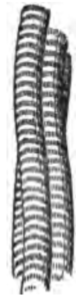

Fig. 11.

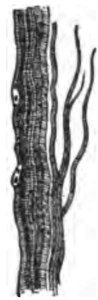

Fig 12.

From these three examples one can see how important it is that the muscles should be cut across the grain instead of the length of the fiber, if one would have tender meat.

Explanation of Fig. 10.

We will begin with the skeleton of an ox. In Fig. 10 (a^1, a^2, a^3, a^4, a^5, a^6, a^7) are the vertebræ, which extend from the head to the end of the tail. Examine the bones of the spine in each section, that you may be able to recognize them in the cuts of meat that come from these parts, always remembering, of course, that each bone is split into two parts, and that you find but one half of it in the joint of meat. (The split side is shown in Fig. 17.) a^1 to a^2 is that part of the spine belonging to the neck. Beginning at a^2 and going back to a^3 are found the joints to which are attached the six chuck ribs. The projections on these joints are partially hidden by the shoulder-blade, but they are quite long. Beginning at the point a^3 and going back to a^4 are the joints to which the seven prime ribs are attached. From a^4 to a^5 are the joints of the loin. The tenderloin begins in a small point under the first rib, and it increases in thickness as it runs back. It finally terminates in an obtuse point at the hipbone. The tenderloin is covered with a thick bed of suet. The kidneys are embedded in this at the end near the ribs.

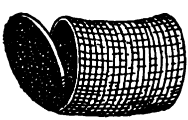

Fig. 13.

(See Fig. 17.) It is from this section that the sirloin and porterhouse roasts or steaks are cut.

Where New York method of cutting differs from Boston and Philadelphia.

The point between a^5 and a^6 in the New York method of cutting is left on the sirloin, while in Boston and Philadelphia it is left on the rump. In New York this cut is called the thick or hip sirloin, the hip-bone being cut at the line a^6 b. This portion is quite as often cut into steaks as roasts, the steak taking the name of the cut portion of the hip-bone, as hip-bone steak, flat-bone steak, and round-bone steak. (See Figs. 20, 21, 22.)

Why it is called the whirl-bone.

You will observe the position of the thigh-bone in its relation to the hip-bone; k indicates the socket in the hip-bone, and l the ball in the thigh-bone. This is called the whirl-bone by butchers, because when the hind quarter of the animal is hung by the leg, as it always is, this bone is whirled round, bringing the leg at an angle of about thirty degrees with the backbone, thus changing the position of the bones and muscles of the leg. (Figs. 15 and 16 show this change.) Seeing this change in the skeleton and muscles, it will be easy to understand how and why the hind quarter is cut in a certain manner when we come to the diagram illustrating methods of cutting beef. (Fig. 18.) If the carver will study Figs. 15 and 16, he will learn the position of the bones and direction of the muscles in the leg or hind quarter of mutton, lamb, veal, venison, etc., and will then know how to carve so as to cut across the grain of the muscular fibers.

The triangular section at a^6 b, a^8 b, which takes in the greater part of the hip-bone, a small piece of the thigh-bone, and a portion of the backbone, is called the aitchbone in some sections. In New York it is called the rump piece, and is usually divided into two parts, one taking in the backbone and the other the hip-bone. These cuts are generally used for corned beef.

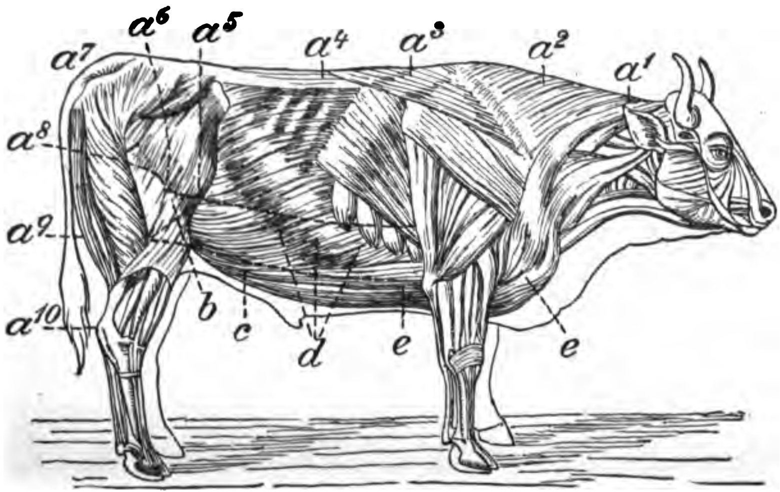

Fig. 14. Muscular System.

a^1, neck; a^2 to a^3, chuck ribs and shoulder-blade; a^3 to a^4, seven prime ribs; a^4 to a^5, loin or porterhouse; a^5 to a^6, thick sirloin, sometimes cut and sold as rump, known in Boston as back of rump; a^6 to a^8, cut in New York as a rump piece; a^7 to a^8, cut in Boston as aitchbone; a^8 to a^9, round; a^{10}, leg of beef; *b*, top of sirloin; *c*, flank; *d*, plate piece; *e*, *e*, brisket.

The point at a^7 is where the aitchbone is divided into two parts. The thigh-bone below the straight line belongs to the round.

Observe the formation of the shoulder-blade at *c* and *d*. The upper part (*c*) is thick cartilage, which touches the seventh rib; therefore it does not lessen the value of this joint; but beginning with the eighth rib there is both bone and cartilage. Here is where the chuck ribs begin.

A cut that used to be very popular for a cheap roast, steaks, pot-roast, stewing, etc., was the "cross-rib piece," known also as "shoulder clod," "bowler piece." It is still cut by many butchers. Formerly it always contained the rib-bones, but it is now more usually cut without the bones. *e, e, e, e, e,* indicate the position of this cut; *f* and *g* are the bones included in a shoulder of beef; *h*, the sternum, is the bone in the thick end of the brisket.

Fig. 14 shows a beef with the skin and fat removed, leaving bare the muscular covering of the skeleton. This should be studied carefully by the marketer and the carver.

Location of muscles.

This illustration can be studied for the position and direction of the muscles in veal, mutton, lamb, and all animals of this kind. It will be observed that the arrangement of the muscles in the fore quarter is much more complicated than in the hind quarter. There are more bones to move in this part; hence the greater number of sets of muscles, and the necessity for their going in many directions. Each cluster of muscles is finished at the ends with a smooth, white, tough substance, the tendons, by which they are attached to the bones. The tendons become gelatinous on being subjected to long, slow cooking. They are what make the drumsticks of roast poultry and the knuckle of mutton or lamb, when properly cooked, such delicious, succulent morsels, and when cooked at too high a temperature, such hard, unsavory food.

Study this cut carefully, observing the direction in which each set of muscles run. Test your knowledge of the skeleton by trying to locate the different bones.

Locate the different cuts by the description of Fig. 14.

The cuts of beef may be divided into three qualities:

First quality, the portions suitable for roasting or broiling. These are taken from the tenderest part of the animal, and bring the highest price.

From the hind quarter are taken the first, second, and third cuts of sirloin, often called porterhouse (see Figs. 10,

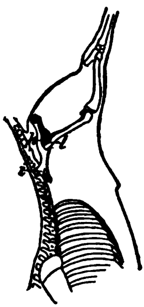

Fig. 15 shows changed position of thigh-bone when the hind quarter of the animal is hung; *i*, the point where loin is separated from hip sirloin; *k*, socket; *l*, ball.

Fig. 16 shows changed position of muscles when hind quarter is hung; *i* is the point where the loin is separated from the hip sirloin.

14, 17, 18, a^4 to a^5); or this section is cut up into steaks, which are variously called sirloin or porterhouse steaks. When there is a large piece of tenderloin in the steak, it is called a large porterhouse; and when the steak is cut from the small end of the loin, where there is only a very little tenderloin, it is called short steak, or Delmonico steak. (See Fig. 23.)

Portions taken from the hind quarter.

Hip or *thick sirloin*, known in Boston and Philadelphia as rump (see Figs. 10, 14, 18, a^5 to a^6), is cut for roasts and steaks.

As cut in New York, and wherever the New York method is followed, these roasts and steaks contain both tender and tough portions. This is particularly true in the case of the steaks, some butchers cutting the whole length, from the backbone to the end of the thigh-bone. (See Fig. 18, a^8 and b.)

The larger the roast the better the result.

Between a^3 and a^4, Fig. 18, are the seven prime ribs, the first three called the first cut of the ribs; but for a small family two make a better-sized roast. One should never attempt to roast a thinner piece than this, no matter how small the family. In beef the larger the roast, the more satisfactory the result.

Second quality. The pieces included in this grade are often used for roasting and broiling, also for braizing, stewing, pot-roasts, etc.

The best part of the top of the round (g, g, Fig. 17) is often used for steaks, roasts, pot-pie, boiled, braized, or alamode beef. From a prime animal this is a most satisfactory piece. There is little, if any, bone (some butchers remove the thigh-bone, while others leave it in the round), and only a desirable quantity of fat.

The eighth and ninth ribs, first cut of the chuck, make a fair roast; the shoulder-blade should be removed and the piece be firmly skewered. The tenth and eleventh ribs are often boned, and sold as rib or chuck steaks, or are rolled, and sold as rolled ribs for roasting, braizing, or pot-roasts. Even the twelfth and thirteenth ribs are treated in this manner in some markets. Sometimes these last two ribs and part of the neck are used for Hamburg steaks.

The tougher ribs (ten, eleven, twelve, and thirteen) may be used for braizing or pot-roasts.

The *cross-rib piece* makes a good economical roast or steaks. By consulting Figs. 14 and 18 it will be seen that the muscles of this piece all run in one general direction. It is an economical cut, being solid meat.

Third quality. The cuts belonging to this class are all much tougher than the foregoing, and require long, slow cooking. The rump piece (Fig. 14, a^6 to a^8) is generally corned where the New York method of cutting is employed. It is cut in two parts, horizontal with the backbone, thus taking in the thick part of the hipbone in one piece, and the backbone in the other piece; the latter piece is the better of the two. By the Boston and Philadelphia methods of cutting, a portion of this cut goes on the part known as the back of the rump, and is used for roasts and steaks.

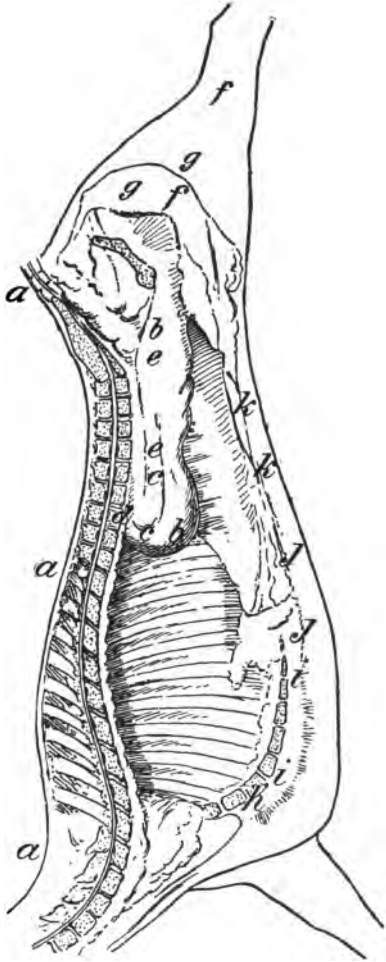

Fig. 17. Side of Beef — Inside.
a, a, a, spinal column; *b, b*, suet; *c*, kidney; *d*, thin end of tenderloin; *e, e*, thick part of tenderloin; *f, f*, inside or top of round; *g, g*, best part of round; *h*, sternum; *i, i*, thick end of brisket; *j, j*, thin end of brisket; *k, k*, flank.

The *flank* and *leg* are used for stewing, braizing, soups, etc. The flank has no bone; the muscles are coarse, loose, and tough; but this piece of meat is very juicy and has a fine flavor. It is excellent for beef-tea; rolled and stewed or braized, it makes a good dish to

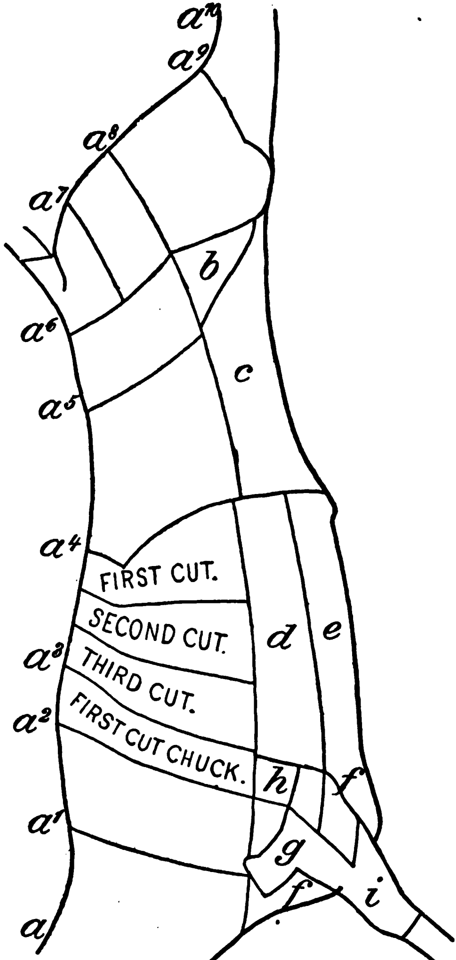

Fig. 18. Side of Beef — New York Method of Cutting.

a, neck; a^2 to a^3, six chuck ribs; a^3 to a^4, seven prime ribs; a^4 to a^5, porterhouse roasts or steaks; a^5 to a^6, thick or hip sirloin; a^6 to a^7, tail end of rump; a^7 to a^8, top of rump; a^8 to a^9, round; a^{10}, leg; *b*, top of sirloin; *c*, flank; *d*, plate piece; *e*, navel; *f*, *f*, brisket; *g*, shoulder; *h*, cross-rib; *i*, shin.

serve hot or cold. This piece is sometimes corned, which is a great pity, for the lean meat is not well protected by fat or bone, and consequently all the fine juices are drawn out into the brine.

Inside the ribs there is a thin piece of muscle called the *skirt*. It is sometimes used for steaks and sometimes for rolling and stewing.

The *plate piece* or rattle-ran takes in the lower part of the ribs, and is nearly always used for corning. It is especially good for this purpose, because the lean meat is well protected with fat. Many people, however, object to it on account of the bones. When this piece of meat is properly cooked the bones are drawn

out and the hot meat placed under weights. When cold it cuts as smoothly as a piece of cheese, each slice consisting of alternate layers of fat and lean. When corned beef is to be served hot, the brisket or rump is a better piece than the plate piece.

The *navel piece* is cut from the bottom of the ribs, and has only a small portion of bone at one end. This is used for corning, stewing, and for soups.

The brisket takes in the ends of the last six ribs and the sternum. There is a difference of opinion as to choice in the thick end or the thin end of the brisket. The thick end is the part in front of the shoulder.

The *shoulder* is that part which is included in the bones *f, g,* Fig. 10. It is separated from the ribs and sternum.

By examining Fig. 14 it will be seen that the muscles in this cut do not run in one general direction, and that there must be many tendons in it; therefore it should be cooked slowly and for a long time. This cut is good for pot-roast, stewing, braizing, Hamburg steaks, etc.

The *leg* and *shin* of beef are full of tendons, and are more suitable for soups than for anything else. The long, slow cooking in water dissolves the gelatin, which gives a consistency and flavor to the soup.

The various kinds of steak cut from beef are:

Short or Delmonico steak.
Porterhouse, large and small.
Sirloin { Hip-bone steak. / Flat-bone steak. / Round-bone steak. }
Round steak.
Rib steak.
Entre-côte steak.
Cross-rib steak.
Shoulder steak.
Hamburg steak.

How sirloin steaks are cut.

As has been stated, the New York sirloin comes from that part of the animal which includes the fore part of the hip-bone. In my lectures on marketing I have found that the division of hip-bone, flat-bone, and round-bone steaks was rather difficult for the average housekeeper to understand. To make this perfectly clear I have had a drawing made of the hip-bone, showing the way this bone is cut in each group of steaks (Fig. 19).

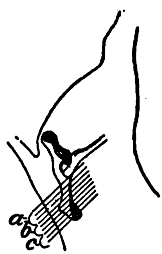

Fig. 19. Showing Method of Cutting Sirloin Steaks.

a, three round-bone steaks — the poorest; *b*, three flat-bone steaks — better than round-bone; *c*, three hip-bone steaks — the best — has large tenderloin.

When these steaks are cut long, *i. e.*, down the length of the thigh-bone, the lower part takes a portion of the "top of the sirloin," although why that piece should be called *top* when it is the bottom, or *sirloin* when it is a part of the round, is incomprehensible.

Fig. 20 shows *hip-bone* steak; Fig. 21, *flat-bone* steak; Fig. 22, *round-bone* steak. Compare the bones in these steaks with the divisions of that part of the hip-bone which enters into them.

Fig. 23 shows *short* or *Delmonico* steak. Examine Fig. 10 at a^4, where the ribs and the porterhouse are divided, and you will see the reason for the name "short steak." It is not possible to cut a long piece of flank on this steak. In the cut given some of the flank has been removed. The name "Delmonico" is derived from the custom of this house of removing the entire tenderloin from the whole porterhouse cut, then serving the top as small steaks, the tenderloin being removed for large fillets or tenderloin steaks.

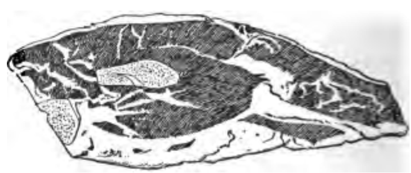

Fig. 20. Hip-bone steak.

The *entre-côte* steak (between the ribs) is a prime rib roast cut into steaks. The ribs are removed, but the piece of backbone is left on. This steak is not much used in this country.

Fig. 21. Flat-bone steak.

The *fillet of beef* is the tenderloin. When this is taken from a prime beef it brings a very high price, often a dollar a pound. A great many fillets are sent from the West, and they sell at a much lower price. They are usually taken from inferior animals that have been slaughtered for canning, making beef extracts, soups, etc. This piece of meat is so protected in the body of the animal that it has but little exercise; therefore it is tender, but without much flavor or nutrition.

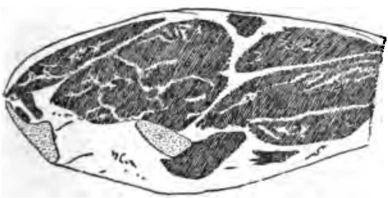

Fig. 22. Round-bone steak.

The muscles on the outside of the backbone (Fig. 18, a^4 to a^5) are finer and firmer, of better flavor, and more nutritious. This part, when taken from the bones in a solid piece, is often used instead of the tenderloin. It is called in France the false fillet; it is much lower priced than the real fillet.

The difference between the false fillet and the real fillet.

Corned Meat.—At the best, corned lean meat can have but little of its natural salts and juices left in it, as the salt draws these out. The better the lean is protected by fat and bone, the juicier

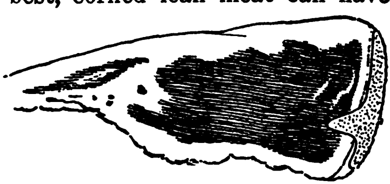

Fig. 23. Short or "Delmonico" steak.

and finer flavored will be the beef. Always aim to purchase a piece of corned beef that has a good layer of fat.

Corned beef must not cook rapidly. Housekeepers often have a decided choice as to the cut of corned beef that they will use. The thick end of the brisket, the rump piece, and the plate will all, if from a good animal, be satisfactory, provided they are cooked five hours, with the water just bubbling at one side of the kettle. Take the finest quality of corned beef in the world, and let it boil rapidly, and you will have a piece of meat that will break under the carving-knife into a bundle of hard, dry, uneatable threads.

Veal.—The best veal is that fed wholly on milk; next comes that fed on milk and meal; the poorest is that which has been grass-fed. **Age and feeding.** The best age for veal is when the calf is between six and ten weeks old. The flesh of a well-fed milk calf will be fine-grained, tender, and white, with just a suggestion of pink. The fat will be firm and white, and there will be a generous supply of it round the kidneys and on the legs. Calves that are fed on part milk and part meal are nearly as good as the milk-fed, provided the feeding is done carefully. The grass-fed calf gives a very poor veal, lean, dry, and dark; still it is not unsanitary. The veal that comes from a calf that has been killed too soon—between two and four weeks—will be soft, flabby, and of a bluish tinge. There should be no sale for such meat, for it is both innutritious and unhealthful.

Veal is not highly estimated in this country, and since creameries, condensing factories, and cheese factories are planted in every good grazing section of the country, the farmers find it more profitable to sell their milk, and destroy the calves when they are only a few days old. In France, where veal is valued highly, the greatest care is taken to have it in perfection. The prime veal is raised in the following manner. The calf is given all the milk it can take, first from the mother, and as it grows older it has the milk of a

second cow also. When the veal is to be particularly fine, eggs are fed to the calf the last two or three weeks of its fattening. They begin with one or two eggs, then increase the number from day to day until they use six or eight a day. The calf's mouth is opened, and the whole egg, shell and all, is dropped in; the closing of the mouth crushes the egg, and it is swallowed. When calves are fed partially on milk and partially on meal, and the eggs are added, the veal is almost as fine as that of the milk-fed calves. Nowhere else in the world does one find such veal as is found in France, and no one complains of its disagreeing with them. All the French veal, however, is not thus carefully fattened; but where the best is so fine it is difficult to sell a very inferior article.

How the calf is divided.

The calf is divided into leg, loin, breast, shoulder, neck, flank, head, and feet. The leg is the most valuable part of the animal. It is cut into slices for cutlets, into one solid round piece for fillet; the thick, tender part is cut into one large, well-shaped piece for fricandeau; a portion of the leg is sometimes boned and roasted. There is no waste in these cuts.

The lower part of the leg is very gelatinous, and is used for soups; it is called a knuckle of veal.

Next in value to the leg is the loin; this cut includes what is known in beef as the porterhouse, sirloin, and rump, and is divided into roasts and chops. The neck comprises the thirteen ribs, which are roasted or used as cutlets.

The shoulder is roasted or braized. The breast is roasted, stewed, broiled, etc.

Mutton.—Good mutton, properly cooked, is one of the most nutritious and easily digested animal foods. Because of the indifferent quality and improper cooking of a great deal of this valuable food, many people in this country have a strong prejudice against it. But if the animal is properly fed and dressed, and the cook does her duty, no meat can be

more savory and appetizing than a roast, boiled, or broiled piece of mutton.

Mutton is best when the sheep is between the age of three and five years. When the animal is between one and two years old it is variously termed mutton, lamb, or yearling, as happens to be the local custom.

Indications of good mutton.

Sheep that have been pastured on hilly land, where sweet herbs are found, have a peculiarly fine flavor. The bones should be small; the lean fine-grained, a rich red, and juicy; the fat firm and white. A lean animal does not produce good meat. There should be a thick layer of fat on the back and the thick part of the legs. The neck and shoulders are always fat. Mutton, like beef, should hang long enough to be thoroughly ripened. In winter this can be from three to six weeks; in summer, except in cold storage, it is not possible to keep it so long.

Mutton must be thoroughly ripened to be good.

The various cuts of mutton are the leg, loin, shoulder, neck, breast, flank. When the leg and loin make one joint it is called a haunch of mutton. When the two loins are left together the joint is called a saddle.

Various cuts of mutton.

Butchers cut long and short saddles. When the rump and a small piece of the tail are left on the loins it is called a long saddle. (See Fig. 29.) When only the loins constitute the piece, it is a short saddle.

Sometimes the ribs and loin are left in one piece; it is then called the rack. As a rule the first eight ribs and the loin are cut into chops. When the thin bones of the rib chops are trimmed they are then called French chops. These chops are a delicate, appetizing dish, but expensive, as the proportion of lean meat to fat and bone is so small. The loin chops are what in the beef would be called porterhouse or sirloin steaks. They are more profitable to buy than the rib chops. The chuck ribs are sometimes cut into chops and

the shoulder-blade removed. These chops have a good deal of meat on them, but it is too tough for broiling, except in the case of a very tender animal.

The end of the neck near the head is in almost constant motion in the living animal; therefore it is tough, but rich in flavor and nutrition. It is the most desirable part for making broths, particularly for the sick.

If the family is large, the leg is the most economical cut to buy; it costs more per pound than any other part, but there is very little waste in it. The fore quarter, with the shoulder-blade removed, makes a good cheap roast for a large family. The shoulder makes a cheap

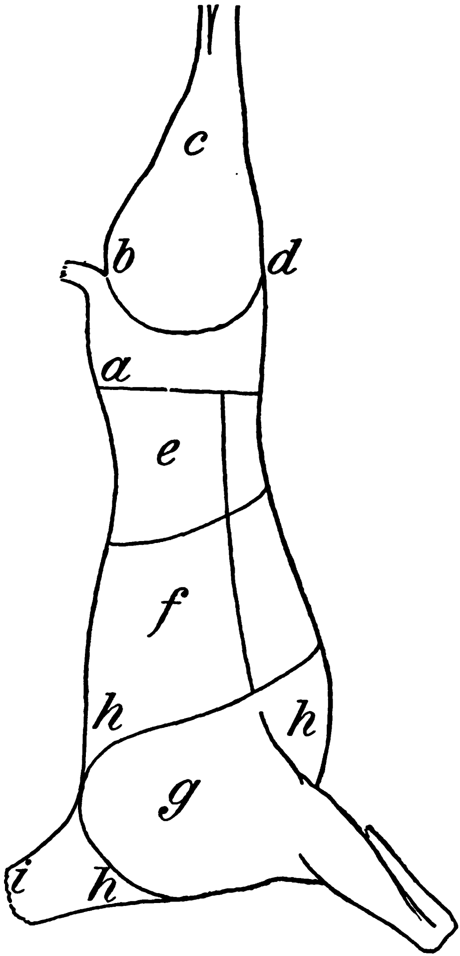

Fig. 24. Side of Mutton.

a, b, c, leg of mutton as usually cut. *a* to *b* is the rump, and contains the backbone and the hip-bone. When a long saddle is cut from the carcass, the dotted line from *b* to *d* is followed, giving a small leg. *e,* loin; *f,* ribs; *g,* shoulder; *h, h, h,* breast. This includes the portion under the shoulder. *i,* scrag end of the neck.

small roast. The ribs and loin make good small roasts. The shoulder, breast, and best part of the neck are often used for roasts. They make excellent stews, pot-pies, etc. The fore quarter or the shoulder alone are sometimes corned. They are boiled and served like corned beef.

For a large family it is cheaper to buy the whole leg of mutton, and have it cut as you wish.

The leg is sometimes cut into thick slices, which are sold as cutlets. If the family is of good size, it is cheaper to buy a whole leg and have the number of cutlets you wish taken off. Keep the balance of the leg for a few days and use it for pot-pie, haricot, or Irish stew, or it may be roasted, if the piece is large enough.

Lamb.—Until the young of the sheep is a year old it is called lamb. *Spring* lamb is from six weeks to seven or eight months old. The best is between three and five months old. The very young lamb is neither fine-flavored nor nutritious, and that which is older than five or six months has no longer the delicate flavor and texture which should characterize spring lamb. The lamb that is in the market in January, February, and March is valued for its rarity rather than quality, and is so expensive that it is found only on the tables of the wealthy.

The best age for spring lamb.

Young lamb is divided into hind quarter and fore quarter; as it grows older it is divided like mutton. The lean of the lamb should be pink, and the fat white and delicate. It spoils quickly, and should be hung only a few days.

How the lamb is divided.

Pork.—The flesh of the hog is variously esteemed. The very fat portions are always salted, while the lean, except the leg and shoulder, is generally sold fresh. The ribs and loin are the most desirable parts for roasting and chops. When the animal is very large and fat the thick layer of fat is taken from the ribs and loin and is used for salting; this leaves the loin and ribs thin and comparatively lean, a most

desirable condition. The shoulder is sometimes used fresh for roasting or boiling. It is not a desirable joint for this purpose, except in very large families.

Pork, whether fresh or salted, should be above suspicion. In fresh meat the fat should be firm, clear, and white, and the lean pink. In the salted meat the fat is sometimes a delicate pink; this is an indication of sweet, healthy pork, but it is more usual to find it without color.

Pork must be above suspicion, and must be thoroughly cooked.

Diseased or measly pork has a dull appearance and yellowish lumps through the fat and lean. Such pork should not be sold. If there were no purchasers it would not be found in the market.

Great care should be exercised in purchasing all kinds of meat, but pork more than the meat of any other animal must be in a healthy condition, and under no circumstances should it be eaten unless thoroughly cooked.

SOME CHARACTERISTICS OF THE MUSCULAR FLESH OF ANIMALS

The flesh of the mature animal is improved by hanging for a long time in a low, dry temperature. It is more nutritious, more highly flavored, and more digestible than that of the immature animal, the flesh of which is watery and gelatinous, and spoils quickly. Consequently in making broths for the sick this fact should be kept in mind, and the well-exercised muscles of the mature animal should be used for this purpose. Nearly all the immature animals are in market through the spring and summer, and to some extent in the fall; but there is little of this kind of meat to be found on sale in the winter.

Rigor Mortis.—After the death of an animal the muscles become rigid. Sometimes this occurs very quickly, and, again, it may be hours before this state is developed. This

stiffening of the muscles is supposed to be due to the separation and coagulation of the albuminoid substance in the fluid of the muscles. After a time (sometimes many days, and, again, in a few hours) the muscles relax, some change taking place in the albuminoid.

Meat will not be tender and juicy if cooked while the muscles are rigid. It may be cooked before rigor mortis occurs, but this is not often done, for two reasons: first, it is rarely convenient to cook an animal as soon as killed; and, second, there is a more decided animal flavor, which is not agreeable to the majority of people. The drier and cooler (but always above the freezing-point) meat can be kept while ripening, the better. Meat spoils rapidly in a humid atmosphere.

Meat will not be tender if cooked while muscles are rigid.

Effect of Freezing.—In meat, as in all substances, the tendency of freezing is to separate the liquid from the more solid parts. Meat (cooked or uncooked) that has been frozen is never so juicy as it would be if it had not been frozen; after being in that state and then thawed, it should be cooked as soon as possible, as it will not keep well.

THE MINOR PARTS OF THE ANIMAL

There are portions of the animal which are variously esteemed. In the city markets one finds almost every part and organ of the animal on sale. In some country places the butchers do not take the trouble to dress the head, feet, or any of the internal organs, except the liver; but in the hog the head and feet are generally dressed and sold.

Feet.

The **feet** of sheep, calves, and hogs are cleaned, boiled, and pickled, or they are used in stews, or fried in crumbs after having been boiled. Calves' feet are also used in soups and jellies; these and pigs' feet are most highly prized. The feet of all animals are very gelatinous.

On the continent of Europe they use the feet of poultry in soups and ragouts. They are sold in the market like the feet of butchers' meat; they are a desirable addition to a stock, giving it extra body.

Calves' and pigs' **heads** are more desirable than any others; they are found in the markets, thoroughly cleaned. Sometimes half a head can be purchased. **Heads.**

The **liver** of all the animals is sold as food. Calves' liver is the best; it is usually light and clear in color and tender in texture. Beeves' liver is dark and often hard or tough. Pigs' liver is, by many people, preferred to beeves' liver. **Liver.**

The liver is the largest gland in the animal. Physiologists are still in doubt as to what all its functions are, but it is agreed that one of its offices is to maintain the uniform composition of the blood. It is one of the organs that is frequently diseased; therefore it should never be used without being first thoroughly examined. If the texture is clear and smooth one can be reasonably certain that it is in a healthy condition. If, on the contrary, there are streaks or spots in it, it must be discarded. These indications hold true also in the case of the livers of poultry or birds. **The liver should always be thoroughly examined before using.**

Kidneys.—Veal, lamb, mutton, and beef kidneys are all used as food; they, like the liver, should be examined carefully. Good healthy kidneys will have a clear, bright color; if diseased they will be cloudy and contain spots.

Hearts.—The hearts of animals, when cooked with care, make a cheap, nutritious dish. They may be stewed, baked, or braized.

Tongues.—The tongues of all animals are used for food. They should be firm and plump; when lean and flabby they will not make a tender dish.

Tripe.—The stomach of the ox furnishes tripe. The butcher sells it cleaned and boiled. It should be plump,

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white, and tender; when thin and dark it comes from an animal that was not in good condition, and will be tough and unsatisfactory, even if it should be in a healthy condition, which is doubtful.

Sweetbreads.—The thymus and pancreatic glands of the young calf and lamb are sold in the city markets as sweetbreads. Formerly only the heart sweetbread (pancreas) was sold, the thymus being left in the neck. The demand for these glands is now so great that the two are left together and sold as a pair. They vary greatly both as to size and quality, depending upon the age, food, and condition of the animal. For this reason it would seem more just to sell them by the pound (as is done sometimes) rather than by the pair. When the sweetbreads are taken from an animal that has been fed wholly and generously on sweet milk they are plump, white, compact, and firm. If the animal was not properly fed, or was pastured, they will be dark, flabby, and tough.

Quality depends on food and age of animal.

These glands are rarely taken from any but the young calf or lamb, and, as a rule, the thymus gland has either been absorbed or changed to a fatty or fibrous substance at the end of the first year of the life of the animal. The pancreas becomes tougher and darker, but it is never changed or eliminated, as is the thymus gland. It is not, however, an unusual thing to find these glands in a steer three or four years old in such fine condition that they make a very good dish.

Sweetbreads spoil quickly; therefore they should not be kept many days, unless it be in cold storage. The fine ones are often frozen for use in winter, when veal is scarce.

The brains, palates, eyes, marrow-bones, lungs, etc., are all employed as food. The brains of the calf, sheep, and lamb are the best. The marrow-bones from beef are those usually employed.

GAME AND POULTRY

Under the head of game is comprehended venison (the meat of the deer), bear-meat, rabbits, squirrels, many varieties of duck, partridge, grouse, ptarmigan, quail, woodcock, wild pigeons, and a great many small birds.

Venison. The venison is cut very much like mutton. It should hang long enough to get thoroughly ripened—three weeks or more. Venison to be good must be fat; the lean is much darker than that of beef, and the fat whiter. This is one of the meats that must be served rare and hot, if you would have it in perfection.

Game birds. Game birds do not have the feathers removed until they are to be used. Let the butcher have this done before sending them to you. Be sure that the skin is not torn off, as it is very necessary in cooking birds.

Rabbits and squirrels. Rabbits and squirrels should not be skinned until they are to be used; like birds, they dry if their natural covering is removed any length of time before cooking. Rabbit-meat is white, delicate, and savory when young, but dark and tough when old. The claws are rough and long in old rabbits; when tough they should be cooked slowly.

Game birds are generally sold so much a piece, pair, or dozen.

Poultry.—The question as to whether poultry for the market should be drawn or undrawn has been settled differently by different States. **Drawn and undrawn.** It is a great pity that any State should decide in favor of undrawn poultry. Where this is the law, there certainly should also be a law, which should be enforced, that the animal go without food long enough to empty the crop. This is the law in some States, but it is not always observed.

There are two methods of removing the feathers from poultry, one by plucking them from the dry bird, and the

other by first plunging it into boiling water. By the latter method the feathers are removed more easily than by the former, but the water injures the flavor of the meat and impairs its keeping qualities.

Dry-picked and scalded.

To know which is scalded and which is dry-picked is a simple matter. The hot water contracts the skin, which is drawn tightly over the flesh, giving the bird a plump, attractive appearance. In the dry-picked bird the skin is loose and may be moved about on the flesh, and it has a rather rough appearance. To the novice it will look less attractive than the scalded bird. Dry-picked poultry is generally several cents more per pound than the scalded, but it is worth the difference.

Tests of good poultry.

Some of the tests of good poultry are: (1) the bird should be short and plump in proportion to its weight; (2) skin smooth, but not the smoothness that comes from scalding; (3) legs smooth; (4) toes pliable; (5) in poultry for roasting and broiling, the end of the breast-bone should bend readily—it must not be broken; (6) a large amount of meat on the breast; (7) the windpipe in ducks and geese brittle, breaking easily when pressed between the finger and thumb.

Poultry, like all other meat, must be fat to be good. Housekeepers have their preference as to yellow or white fowl; mine is for the yellow, as it seems to me that the flavor is richer than in the white chicken.

Marketmen have a way of putting one of each in a pair, but they will change to whichever kind you prefer.

Kinds for various methods of cooking.

Only young, tender poultry should be roasted or broiled, but the more mature birds are better for boiling, stewing, and fricassees, as the proportion of meat to bone is greater than in the younger bird. Older fowl are also cheaper. All poultry is suitable for roasting from the time it is three months until it is about a year old; after that the slower methods of cooking are better.

Fish.—The first consideration in choosing fish is that it be fresh. For this reason it is better to use such fish as is caught near home than that which must be brought from a distance. The firmer the flesh of the fish, the longer time it will keep in good condition. All fish contain a thin albuminous substance, which in cooking is changed to a white curd if the fish is fresh and in a healthy condition. This is very noticeable in cod and halibut, and all fish of this class, where it makes a thin layer of a soft, creamy substance between the flakes. If the fish has been kept too long this substance undergoes a change which prevents its coagulation, and the cooked fish is watery and of a bluish appearance, instead of being firm and white. Sometimes in the spawning season the cooked fish, even when perfectly fresh, has the same blue appearance.

Indications of quality.

Fresh fish will be firm, the scales bright, the gills red, the fins firm and erect. The fish from pure running streams, clear ponds and lakes, and from the ocean are the safest and best. Fish are very sanitary, and do not live in any great number in waters that are badly polluted, but they may absorb just enough of the pollution to make them unhealthy and often dangerous, as, for example, oysters that grow in beds at the mouths of rivers from which sewage is discharged into the ocean or bay. Fish that inhabit stagnant waters or live at the bottom of muddy ponds never have a fine flavor, and one cannot feel that they may be as healthy as those from pure waters.

CARE AND PURCHASE OF GENERAL SUPPLIES

The care and purchase of household supplies depend upon where and how one lives. The family in a flat with little or no storage accommodation must of necessity buy only in small quantities, while the householder with cellar and plenty of other storage-room will find it a saving of time and money

to lay in stores that may be kept for any length of time in large quantities.

Green vegetables should be purchased only when needed. If asparagus or lettuce must be kept for a day or two, put some water in a shallow dish, and let the roots rest in the water, which should never be more than an inch deep.

Chicory, sorrel, and all kinds of herbs may be kept fresh and crisp in the same manner. It must be remembered that only the root ends go in the water. The cooler all vegetables are kept, the better.

How to keep green vegetables fresh.

When vegetables have lost their freshness and crispness by being kept any length of time, the freshness may be restored to a great extent by soaking them in cold water—ice-water, if possible.

Winter vegetables should be perfectly ripe before being gathered. The skin on fruit or vegetable, when fully ripe, forms an almost impervious covering, through which but little moisture can escape. If, however, it is picked before it is ripe, the moisture passes through the porous skin, and the fruit or vegetable shrinks.

Winter vegetables should be driedbefore storing.

All winter vegetables should be dried before being stored, and they should be placed in a cool, dry place. Tuberous vegetables, such as carrots, turnips, beets, etc., will keep better if packed in dry earth or sand. Sweet potatoes spoil quickly, and should be purchased only in small quantities. Apples should be kept in a very cold place. They keep well in a temperature nearly down to the freezing-point. If one has a good, cool cellar, it will be economy to buy the winter and spring supply of apples and vegetables in the autumn, when they are cheap.

Eggs are cheapest in the late spring, summer, and fall. Many housekeepers buy a quantity of eggs when they are cheap, and preserve them for the time when eggs are scarce and expensive. If the shells of the fresh eggs are coated

with some substance that will exclude the air, the eggs will keep very well for many months. It must be remembered, however, that eggs absorb flavor through their porous shell, and they should not be coated with or packed in any substance that can communicate a disagreeable flavor to them. Sometimes quite fresh eggs are spoiled by being packed for a few days in musty oats.

The food of the hens controls the flavor of the eggs to some extent. Eggs are heaviest when first laid, and they lose moisture and grow lighter from day to day.

To test eggs.

To test the freshness of eggs, make a salt solution of one quart of water and two tablespoonfuls of salt. A fresh egg will sink in this; an egg that is not very stale will give just a suggestion of rising, and a very stale egg will float readily.

Butter.—The mode of making and preserving butter has materially changed in late years. Dairy butter is no longer made in large quantities and stored, as in former years. Creamery butter has practically taken the place of the old-fashioned dairy butter; the former does not keep well, and only small quantities should be purchased at a time.

When the cows are pastured in spring, summer, and fall, the butter is richer and of finer flavor than that made from the winter cream, and less of it may be used in making cake and pastry.

Butter absorbs flavors, and it should be kept in a covered stone or earthen jar, and away from all strong odors. To harden butter for daily use keep it covered with cold water.

Milk.—The greatest care should be exercised in deciding upon where the supply of milk comes from, and, when it has been delivered to you, in keeping it where it shall not become contaminated or absorb odors.

At a slight advance in the ordinary price one may now get milk that has been bottled and sealed at the farm, thus

insuring a fairly pure article. Good milk will be slightly straw-colored and have a pleasant flavor and odor. When the milk is thin and blue, it has either been skimmed or watered, or there is something wrong with it. If there is the slightest reason to think that the milk is contaminated, boil it before using.

Color of milk and care of vessels in which it is kept.

The greatest care is required in the treatment of the milk after it is received into the house. The vessels in which it is kept should be thoroughly washed, scalded, and then cooled. The milk or cream should, if possible, be kept in a cool, well-lighted and -ventilated room. Fresh and stale milk should never be mixed, unless they are to be cooked at once.

Groceries.—Even in small apartments it is wise to purchase at least a month's supply of groceries, as it is a great waste of time and patience to find each day that something is wanting that necessitates a trip to the grocer's, and perhaps delay in preparing a dish which requires but one thing to complete it. Every store-closet should be supplied with sugar, flour, tea, coffee, chocolate, eggs, breakfast cereals (if used), molasses, salt, pepper, spice, rice, macaroni, bicarbonate of soda, cream of tartar, baking-powder, flavoring extracts, vinegar, gelatin, barley, starch, bluing, soap, and sal-soda.

All dry groceries and cereals should be kept in glass, pottery, or metal. The store-closet should be cool, dry, and well ventilated; heat and moisture, lack of ventilation, and insects are the enemies of all cereals.

Care of dry groceries.

Nearly all kinds of food-supplies absorb flavors and odors to some degree. Chocolate, cocoa, coffee, flour, butter, milk, and eggs are among the things that absorb odors and flavors readily.

As a rule, the best goods are the cheapest in the end. It is especially important that the flour be of the best quality. Good flour will have a pleasant odor and a slightly yellowish tinge. Wet a small quantity with cold water, and work into

a rather stiff dough. If the dough becomes stiff and elastic the flour will make good bread.

The less spice used the better, but in any case it should be of the best quality.

The best sugar is so reasonable that there is no necessity for even poor people to seek a cheap grade.

Porto Rico molasses is more acid than the New Orleans, and is therefore better for gingerbread.

CHAPTER X

THE ART OF CARVING

Some suggestions about carving. General remarks on serving fish.

Advantage and pleasure of carving at table.

There was an old saying among the French that it was as disgraceful for a host not to know how to carve well as it was to have a fine library and not know how to read. Nowadays one is constantly hearing the complaint that carving is a lost art since the Russian style of serving has been in vogue. It is certainly true that for large and ceremonious dinners the carving is not done at the table; but there are few heads of families who, having been accustomed to good living, would willingly, under ordinary circumstances, relinquish the duty and pleasure of carving the joints, poultry, or game served on their own tables. Roasted and boiled meats may only be served in perfection by being carved quickly and well on the table. It is impossible to serve a portion of meat hot, crisp, and juicy from an adjoining room. Besides, there are comparatively few households that can afford a skilled butler or cook who can carve daintily and to good advantage.

Roasted and boiled meats served in perfection when carved quickly.

The art of carving is a most useful and graceful accomplishment, and one which should form a part of the education

of every young man and woman. It is not a difficult art to master, provided one goes about it in the right manner. If one understands the anatomy of the joint or bird, and the direction in which the muscular fibers run, half the battle is won.

Conditions necessary for good carving.

Some of the conditions necessary for success are a cool head, control of one's temper, a sharp knife, a seat high enough to bring the elbows on a line with the table, ample space, a dish that stands firmly on the table and large enough to allow the joint to be carved without any danger of soiling the cloth. Having a knowledge of bones and muscles, and all the conditions being favorable, the carver will be able to do his work scientifically, rapidly, and gracefully.

Realizing how much clearer a few pencil lines may make things than pages of written instruction, whenever it has seemed desirable the methods of carving a joint or a bird have been fully illustrated. As these illustrations are for real helps, and not for embellishment, the lines have been made as few, clear, and simple as possible, that there need be no doubt or confusion in the mind of the carver. If these illustrations are studied carefully, and if, in addition, the carver will study, in the chapter on "Marketing," Figs. 10, 11, 12, 13, 14, 15, and 16, the position of the bones and the direction of the muscles in the various cuts of butchers' meat will be clearly understood, and will aid the carver in knowing in what direction he should cut a joint, that the slice of meat may be cut across the grain.

Value of the illustrations if carefully studied.

The four cuts showing the bones, muscles, and mode of carving a shoulder of mutton are given as a study of the complicated manner in which the muscles are arranged in this part of the domestic animal. It would be an easy and valuable lesson to bone an uncooked shoulder of mutton. When purchasing this joint, ask the butcher not to bone it. With a sharp

Why four cuts of shoulder of mutton are given.

knife pare off all the outer fat, leaving the lean bare. Then slip the knife between the bone and the flesh, beginning at the broad end of the shoulder-blade, and work down to the arm- and leg-bones. Remove the meat on the under side of the bone in the same manner. Examine the muscles to find the direction of each set.

This piece of meat, when taken from a good fat animal, will contain thick layers of fat between the lean. Some of this may be removed, and the lean meat boiled, roasted, or braized. It is not as tender as some of the prime cuts, but it is very sweet and juicy.

SOME SUGGESTIONS ABOUT CARVING

Knives to be used.

There should be a long, broad-bladed knife for roast beef and other large joints; a smaller and narrow-bladed knife for poultry and small joints. The fork should have a guard, which should be up while one is carving. The knife must be examined and sharpened on the steel before it is used; this should be done before it is brought to the table.

Best way to sharpen a knife.

In sharpening on the steel, be careful not to bear heavily on the knife, or to hold it at too sharp an angle. The best way is to draw the knife under and over the steel, at an angle of about fifteen or twenty degrees, drawing from the end of the knife near the handle down to the point. The last strokes should be very slow and light, to even up the edge, if by chance it has become slightly turned.

Carving-knives should be ground once in a while. Unless you know how to do it yourself, or know of a good place where it may be done, ask your butcher to have it done for you. There is a French make of knife which is inexpensive and very satisfactory; they are called cooks' knives (the name of the maker is Sabatier). One can afford several sizes

of these knives, and they will be found invaluable. A French knife for carving poultry that solves the problem of joints for the inexperienced carver is called a disjointer or knife-scissors. It is, however, too expensive for people of moderate means, the knife and fork in ebony handles costing fifteen dollars, and in ivory twenty-five dollars.

The carver's chair should be broad and high.

The carver's chair should be broad, firm, and high. There is no reason why any one should stand to carve.

Garnishing should not interfere with work of carver.

A joint or bird should not be garnished with anything that will interfere with the work of the carver. Parsley, cress, and chevril may be put aside by the carver; therefore they are not objectionable; but any substance that interferes with the work of carving is not advisable, no matter how decorative. It is impossible to carve easily on a small platter; it is well to have a plate on which the carver may put trimmings or bones that are not to be served.

Each joint or fowl should be so carved that if all is not required for one meal, it shall present a neat and attractive appearance the second day. Every slice or joint should be cut smoothly and neatly; a joint or fowl that has been hacked is unappetizing and wasteful.

Problem of asking a guest's preference for light or dark meat.

Finish carving one side of a joint or fowl before beginning on the other side. When carving poultry, whether to ask the guests for their preference as to light or dark meat is a problem. Naturally, one wishes to please every one at the table; but if, by chance (and this often happens), the majority of the guests give a preference for one kind of meat, the carver is in an embarrassing position. There was a time when one felt assured that the ladies would prefer light meat; but women have learned that dark meat is juicy and fine-flavored, and even the long-despised drumstick is now the first choice of many.

One may always be safe in cutting across the grain in all joints. Even the most tender piece of meat will be tough if it is cut with the grain, *i. e.*, with the length of the fiber.

Always safe to cut across the grain.

Where the muscles are short and not much used, as, for example, the breast of poultry and birds, it is not imperative that they should be cut across the grain.

When carving poultry or birds one is sure to strike the wing joint at the right point if the knife is in a line with the top of the leg where it touches the body.

Sirloin of Beef, or Porterhouse Roast.—This joint is known in different sections of the country under the above names. It may be divided into three parts: *a*, the back or top; *b*, the tenderloin or fillet; *c*, *c*, the flank. The most tender part is the tenderloin; next is the top. The flank is tough, coarse, and loose-grained, but very juicy and fine-flavored. Even though it is not served at the table, it is an advantage to cook it on the joint, as it makes such a quantity of dish gravy. The crisp fat on this part of the roast is also a desirable addition to the dish.

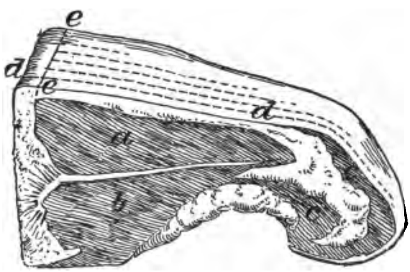

Fig. 25. Sirloin or porterhouse roast.

If the tenderloin is to be served with the other portions, turn the joint on the end, and slip the knife between the bone and the tenderloin, being careful to keep the edge of the blade close to the bone. In this manner the tenderloin may be removed whole, and slices cut from it as they are required.

Turn the joint back into its former position.

1. Cut close to the backbone, following the dotted line *e*, *e*, and cutting sharply down the spine.

2. Slip the knife between the spine and the meat.

3. Cut thin slices in the direction of the dotted lines *d, d.*

Serve a small piece of crisp fat from the flank with each slice of beef, and pour a spoonful of dish gravy on each portion of meat.

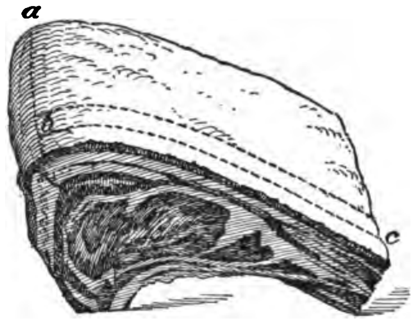

Fig. 26. Roast ribs of beef.

If only a portion of the joint is to be carved, do not cut the whole length of the dotted line *e, e.* It is a good plan to cut at once as many slices as there are persons to be served, separating each slice at the end of the carving; then all tastes may be suited, and the service may be prompt.

If one wishes, the tenderloin may be carved first; slices from this portion of the joint should be thicker than those which are cut from the top.

Roast Ribs of Beef.—Have the thick end to the left (Fig. 26). Cut from *a* to *b* straight down to the bone; slip the

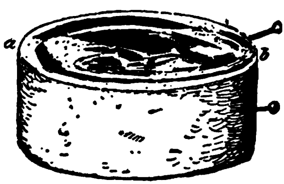

Fig. 27. Round of beef.

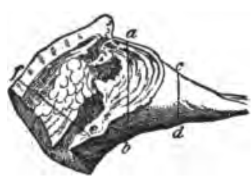

Fig. 28. Leg of mutton.

knife between the ribs and the meat. Cut thin slices, following the dotted lines *b, c.* (Read suggestions in "Sirloin Roast.")

Rolled Ribs of Beef.—Carve like a round of beef (Fig. 27).

Round of Beef.—Have a sharp, broad-bladed knife, and cut thin slices from *a* to *b*.

Leg of Mutton.—The carving of a leg of mutton is not difficult until you come to the hip-bone, and in what is called a short leg this is often wanting, having been cut into chops. However, as a rule it is found in the average leg.

Have the leg placed on the dish in the position indicated in Fig. 28.

Make the first incision at the line *a*, *b*, where you will just touch the edge of the hip-bone. Cut slices about one fourth of an inch thick. The slices will be large and rare until you reach the line *c*, *d*. Here they begin to grow smaller and better done.

If some like underdone and others well-done meat, the better plan is to make the first cut near *c*, *d*, cutting downward toward the knuckle for well-done slices, and upward for the underdone; serve a thin slice of crisp fat from *e* with each portion. In a properly cooked leg of mutton or lamb the knuckle is a choice morsel; ask if any one would like a bit of this.

The knuckle of lamb or mutton is a choice morsel.

When one side is carved, turn and carve on the other side, following the same general direction.

Some carvers prefer to begin with the other side, taking the first slices from the back, cutting either parallel or at right angles with the backbone. Chops may be cut from *f* to *e*.

Mutton must be served hot and carved rapidly.

It is needless to say that this, as all dishes of mutton, should be served hot. The carving must be rapid, the plates hot, and the vegetables served at once.

Saddle of Mutton.—1. Turn the saddle on one side, and remove the tenderloin, kidney, and fat, all in one piece. This is easily accomplished if the sharp edge of the blade of the knife slants toward the backbone.

2. There are three methods of carving a long saddle of

mutton. One is to cut long, thin slices parallel with the backbone, as indicated by the dotted line *a*, *b*, in Fig. 29. Another is to cut thin slices in a slanting direction, as indicated in the dotted lines *c*, *d*, cutting thin slices of fat from *b* to *f*. Still another method is to cut as indicated by the dotted lines *g*, *a*, then in slanting slices from *c* to *d*. By consulting Fig. 14 it will be seen that the last method has the advantage of cutting all the portions across the grain. A slice of kidney should be served with each portion.

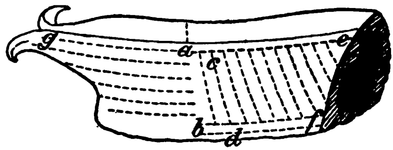

Fig. 29. Saddle of mutton.

Haunch of Mutton.—This joint is carved like a haunch of venison (Fig. 38).

Loin of Mutton.—This joint can be carved like a saddle, but it is more usual to separate it into chops. When the roast is to be carved in this manner, the butcher must have orders to disjoint the bones.

Roast Shoulder of Mutton.—A shoulder of mutton, lamb, veal, and venison may all be carved in the manner indicated in Figs. 32 and 33. Follow the dotted lines, and you will cut across the grain. Fig. 34 (shoulder-blade, arm- and leg-bones) and Fig. 35 are given to show the position of the bones and muscles in this cut.

This joint is apt to be very fat in mutton, and should be served very hot.

Fore Quarter of Mutton.—Carve as directed for fore quarter of lamb, except that the neck should not be served. As a rule, it is too tough, in the mature animal, for anything but stewing.

Leg of Lamb.—This is carved the same as a leg of mutton.

Hind Quarter of Lamb.—Carve the leg as directed for mutton, and cut the loin into chops.

Fore Quarter of Lamb.—1. Cut off the shoulder, following the dotted line from *a* to *b*.

2. Separate the ribs into chops, cutting in the direction from *c* to *d*. If it is a spring lamb the thymus gland or throat sweetbread should be found in the neck. Carve the

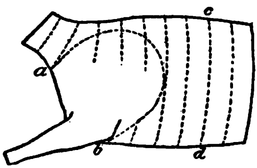

Fig. 30. Fore quarter of lamb.

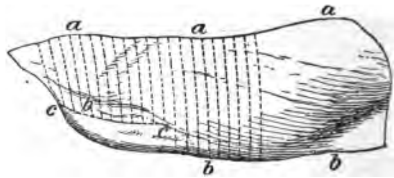

Fig. 31. Breast of veal.

shoulder as directed for shoulder of mutton. Every particle of spring lamb is tender; therefore the neck is served.

Loin of Veal.—This joint is often stuffed, the thin flank piece overlapping the stuffing and kidney. If a chop is served to each person it makes too large a portion. Remove the kidney. Carve the same as a sirloin of beef. Serve with each portion a slice of kidney and a slice of the flank, with some of the stuffing attached.

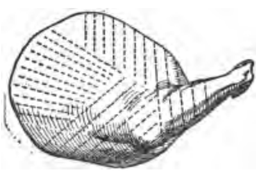

Fig 32. Method of carving a shoulder of mutton.

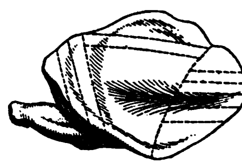

Fig. 33. Method of carving the under part of the shoulder.

Breast of Veal.—The breast of veal is what answers to the brisket and cross-rib piece in beef. Where the shoulder has been removed the layer of meat is thin, and should be protected and moistened while cooking by thin slices of fat pork, or, if the pork is objectionable, by buttered paper. If

the ribs are short, serve one with each portion cut from *a, a, a,* to *b, b, b.* The brisket, *c, c,* may be divided into two portions. In the calf the bones are so tender that they may be cut with a sharp knife, but it is better to have the butcher separate the joints.

How to protect thin end of breast of veal when cooking.

Neck of Veal.—The neck of veal is the upper part of that portion of the fore quarter from which the shoulder and breast were taken. It includes the chuck ribs and the neck part. Sometimes the throat sweetbread is found in the neck. Have the butcher separate the joints of the backbone. This joint may be carved in chops, or thin slices may be cut from the ribs, as in the case of ribs of beef. Naturally, the slices are small.

What is included in a neck of veal.

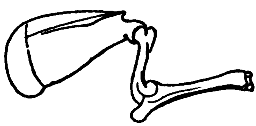

Fig. 34. Position of shoulder-bone.

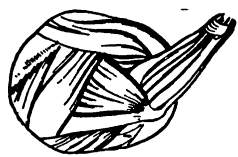

Fig. 35. Showing position of muscles in shoulder.

Shoulder of Veal.—Carve this like the shoulder of mutton. Sometimes the shoulder is boned and stuffed; in that case begin at one end and cut slices through the piece. This requires a sharp knife and great care that the slices shall look smooth and inviting.

Roast Fillet of Veal.—The fillet of veal and fricandeau are both carved like a round of beef. (See Fig. 27.)

Loin of Pork.—This joint may be carved in thin slices, like a sirloin roast of beef, or it may be separated into chops, each person being served with one chop.

Spare Ribs of Pork are cut between the ribs; each person is served with a rib.

To Carve a Ham.—A boiled or roast ham is a dish that, as a rule, comes to the table many times. It should be carved

in such a manner that the last cuts shall be as moist and well flavored as the first. The small or knuckle end is less fat and juicy than the broad, thick end; therefore it dries quickly, and should be the part first used.

Cut in the direction of the lines (Fig. 36), cutting clean and straight to the bone. Have the slices very thin. Continue cutting toward the knuckle.

When the ham is set away the cut part should be protected by paraffin paper.

Tongue.—A tongue, like a ham, has its thick and juicy end, and also its dry end. It should be carved so as to use the thin, dry end the first day. Begin cutting at *c, d,* slanting the slices, which cut very thin; when you have carved as many slices as

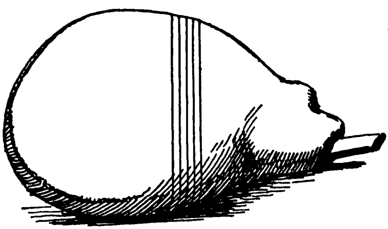

Fig. 36. Ham.

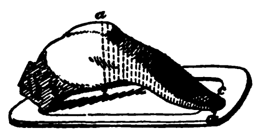

Fig. 37. Tongue.

there are people to serve, carve the same number of slices from the thick part. Follow the line from *a* to *b*. Cut a thin sliver of fat from *e*. Serve each person with a large and small slice of tongue and a little fat.

Haunch of Venison.—This joint includes the leg and loin. To cut the meat across the grain, the direction of the dotted lines in Fig. 38 should be followed. A method common with some good carvers is to cut wholly in the direction of *a, c*. By consulting Figs. 14 and 16 it will be seen that by this method the meat on the leg is cut with the grain.

Venison is carved like the same joints in mutton or lamb.

A leg, loin, shoulder, and fore quarter of venison are carved like the same joints in mutton and lamb.

It is very important that the plates be hot and the carving be rapid.

To Carve a Roast Pig.—This dish is served so infrequently that there is not the same opportunity to perfect one's self by practice as is the case with the greater number of dishes that come to the carver's hands.

The animal is so young that bones and ligaments offer no resistance to a sharp knife. Once knowing how to begin, and where the knife should go, the task is quite simple.

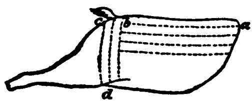

Fig. 38. Haunch of venison.

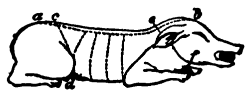

Fig. 39. Roast pig.

There are two methods of bringing the pig to the table; both methods have their advantages. When all the carving is done at the table the meat is hotter and the cracklings crisper than when it is cut in the kitchen; but, on the other hand, if the work in the kitchen is done rapidly and well, and the pig is served on a hot dish, there need be no great loss of heat or crispness, and the time of the carver is saved.

How to carve roast pig.

Have the pig on a large platter, the side toward the carver, and the head at the right hand. Cut off the ears; sever the head from the body; split the head in two. Divide the body in two parts, cutting through the middle of the backbone. Lay the two halves on the platter, back to back, the browned side up. Place half a head at each end and the ears at the sides. The head may be divided into small portions, if the guests express a wish for it.

Separate the shoulder from the body, following the dotted lines from *a* to *b* (Fig. 40). Next take off the leg, following the dotted lines from *c* to *d*. As each joint is taken off, lay it with the crackling side up.

The carver may now begin to serve. To carve the ribs

and loin, cut at right angles with the backbone, as indicated by the dotted lines *e* and *f*.

Each person should be served with the part which he prefers; but a portion of the cracklings must be reserved for each guest, as this is the cream of the roast. If the pig is stuffed, a little stuffing goes by the side of the meat. If sauce or gravy is served, it must always be put at the side of the meat, never on it, as that would destroy the crispness.

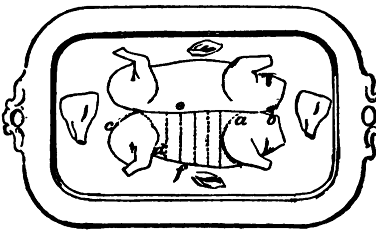

Fig. 40.

In all the work be careful not to tear or moisten the crisp brown skin, which gets its name from making a crackling noise when cut. The French call it "cloth of gold," because of the rich golden brown of the perfectly roasted and basted skin. No matter what the method of carving, it must be done rapidly, that the meat may be served crisp and hot.

Care must be taken not to tear or moisten the brown skin.

To Carve a Turkey.—Opinions differ as to the best position in which a fowl should be placed before the carver. There are those who maintain that the head should be turned toward the carver, while quite as many advocate turning the head from the carver. Others place the fowl with the head toward the left hand and the side toward the carver. My preference is for the latter position; but the position one is accustomed to is, of course, always the easiest.

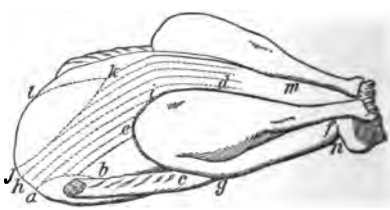

Fig. 41.

Have the turkey served on a large dish; stick the fork firmly in the center of the breast-bone, and carve in the manner indicated in the drawing.

1. Remove the wing, cutting sharply down at *a* to sever the joint, then round the joint, following the dotted lines from *a* to *b*.

2. To remove the leg, cut from *c* to *d*, following the dotted line. With the blade of the knife press the leg back, and cut the ligaments where the thigh-bone is attached to the back; separate the drumstick from the thigh at the joint *e*.

3. Take off the side-bone, inserting the knife at *f*, and cutting up to *g*. The "oyster" is found on the upper end of this bone.

Where the "oyster" is found.

4. Cut thin slices from the breast, beginning close to the place from which the wing was removed; follow the dotted lines *h* and *i*, working up to the ridge of the breast-bone.

5. Take off the wishbone, inserting the knife at *k*, and cutting up to *j* and *l*; then, pressing the bone back toward the neck, disjoint at these two points.

6. The collar-bone lies under the wing. Slip the knife under the broad end, press back, and disjoint.

7. Make an opening in the apron at *m*. You will now have the dark and light meat at your command, and, also, the stuffing in the breast and the body of the fowl.

The tip end of the backbone, known as the pope's nose, is considered by many as a delicate morsel. Insert the knife at *n* to cut off this joint.

If only half the turkey is to be used the first day, do not attempt to take out the wishbone.

In using half the turkey do not remove the wish-bone.

The dark meat on the thigh-bone and drumstick should be cut into small, inviting portions. The wing should be divided into two parts. The meat, stuffing, and gravy should be placed carefully on the plate. The breast, as a rule, may be cut into thin, inviting slices.

Sometimes there are two kinds of stuffing in the turkey, the breast being stuffed with sausage-meat, truffles, etc., and the body with a stuffing of highly seasoned bread- or cracker-crumbs. The carver should be made acquainted with this fact.

Two kinds of stuffing may be used.

Carve only one side; when that is served, the other side may be carved, if it is required.

Cut each joint and slice clean and smooth. A great deal of meat will be found on the carcass after the wings, legs, and side-bones have been taken off.

In some families the legs of the turkey are put aside to be served deviled the next day.

The French sometimes make this dish still larger by leaving the lower part of the backbone attached to the thigh-bone.

Roast Chicken.—A roast chicken is generally carved the same as in the directions for carving a turkey, except that the legs, not being so large, are not divided into so many parts. Sometimes the entire chicken is divided into joints. This is more difficult for the amateur, and more awkward for the guest, than when the meat is cut from the bones. If one wishes to serve a chicken in this manner, the carving is begun as indicated for a turkey. The legs, side-bones, and pope's nose are taken off; the first two joints of the wings only are removed. Cut straight down from this joint to the end of the breast-bone; separate these two long pieces from the shoulder-bone and any ligaments that may hold them. Separate the breast-bone from the back; cut this in two, separating it a little below the joint where the wishbone comes.

Boiled Fowl.—This dish is carved the same as roast chicken.

Broiled Chicken.—If the chickens are small, divide them into four parts in the following manner: Cut through the breast, and separate each half by cutting across at right angles with the top of the leg. When they are large, they may be divided into smaller portions by taking off the wings and legs and then dividing the body into several parts.

Roast Duck.—The method of carving varies with the custom of the house, and whether the fowl is domestic or wild. The wild fowl uses both legs and wings a great deal, thus making the joints tough and hard to carve; while the domestic duck uses the legs much less, and the wings but rarely; therefore these joints are more tender than in the wild fowl. It is the custom in many households to serve only the breast of the wild duck, reserving the legs, wings, and carcass for a salmi. In that case the duties of the carver are extremely simple.

Difference to be observed in carving domestic or wild duck.

In case the entire duck is served hot, it may be carved by either of the following methods:

1. Begin at the wing joint (*a*, Fig. 42), and cut off the wing, following the dotted line from *a* to *b*.

2. Cut off the leg, following the dotted line from *c* to *d*. Press back the leg, and sever the thigh-bone from the back. This joint lies farther back in the duck and goose than in the turkey or fowl.

First method of carving if entire duck is served hot.

3. Cut slices from the breast, following the dotted lines *e*, *e*. Begin at the lower part of the side, and work up to the ridge of the breast-bone. The slices should be cut slanting; if the knife is carried straight down it gives too narrow a slice.

4. The side-bone will be found by inserting the knife at *f*, and following the dotted line.

The side-bone in the duck is short. (See Fig. 43, *d*, *d*.)

A good deal of rich, juicy meat will be found on the sides below the breast-bone. These portions are small, and cannot be cut in regular pieces like the breast, but they should be utilized by serving them with the breast.

The shoulder-blade will be found under the wings. The back may be divided into two parts, if it is to be served. If the duck is stuffed, make an opening in the apron near *f*, and serve the stuffing from here.

The second method has the breast taken off in one solid piece, and is then cut into suitable portions.

Second method of carving a duck.

Fig. 43 shows the position of the joints of the wings and legs, and the method of removing the breast. *a* and *b* show the bones where the wing is disjointed. *c* shows where the leg-bone is attached to the body; *d, d,* the side-bone. The dotted line *e, e,* is in a line with the ridge in the breast-bone, and shows

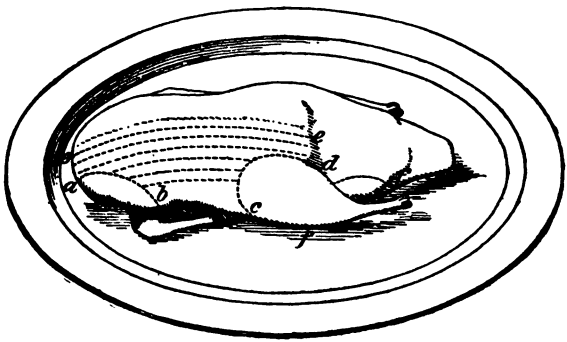

Fig. 42.

where the breast is cut down to the bone; the knife is then slipped under it and worked close to the bone until the entire piece of meat may be lifted off the bone. The lines *f, f,* show the method of dividing this piece of breast.

The carver will do well to study this cut carefully, that he may become perfectly familiar with the joints of the wings, legs, and side-bones.

The carver should be familiar with joints of wings, legs, and side-bones.

NOTE.—The drawings for the carving of the ducks were made at different times; the second duck was shorter and plumper than the first.

Roast Goose.—The only difference in carving a goose and a duck is that, the former being larger, the leg and wing are divided into two or more parts.

Roast Grouse.—The wings of this bird are generally clipped off close to the body before it is cooked. In a ceremonious dinner the legs are not served. When the bird is young the legs are a desirable portion, the flavor being delicious.

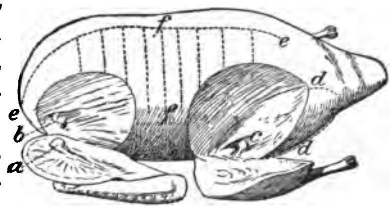

Fig. 43.

Cut the breast in slices parallel with the breastbone. Each breast should give from six to eight slices. Serve a little bread-sauce and fried crumbs at the side of each portion. At some tables each person is served with half a breast; this is hardly to be recommended.

Ptarmigan and **Partridge** are carved and served like grouse.

Small birds.

Pigeons and Quail.—These birds are often served whole, or they may be divided into two parts. In that case cut through the breast and backbone lengthwise.

All small birds are served whole.

GENERAL REMARKS ON SERVING FISH

Steel imparts a disagreeable flavor to cooked fish; never use a steel knife or fork in serving it.

The fat and gelatinous parts of fish.

The fat portions of fish are usually found in the thin flank or belly. The gelatinous portions are near the head and neck. It is for this reason that cod's head is so much esteemed by many persons. The tail is also gelatinous, and is much more delicate than the head and neck.

Small fish.

Small fish, like smelts, brook-trout, perch, etc., are served whole. Fish like mackerel, lake-trout, carp, salmon-trout, shad, etc., are cut through the body, bone and all, as indicated in Fig. 44, thus giving a thick slice; or serve one side, remove the bone, and serve the other.

Cod, haddock, bluefish, etc., when small, are served in the same manner. When large, the portions are cut from one side; the bone is then lifted and sent from the table, and the under part is served. Be careful, when serving fish, to keep the flakes unbroken.

Cod, haddock, bluefish, etc.

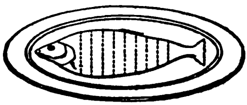

Fig. 44.

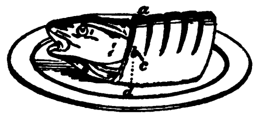

Fig. 45.

Cod's Head and Shoulder.—There being three choices in cod's head and shoulder (Fig. 45),—(*b*, *e*, *d*) the neck, (*c*) the flank, and (*a*) the firm white flakes,—the guest should be asked which part he prefers.

When serving fish containing roe, serve a small piece with each portion.

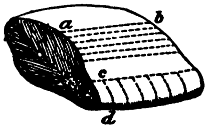

Fig. 46.

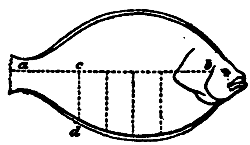

Fig. 47.

All large fish, like salmon, halibut, swordfish, etc., should be carved as indicated in Fig. 46. *a*, *b* is the back, where will be found the firm, large flakes; *c*, *d* is the flank, which is fat and gelatinous.

Large fish, like salmon, halibut, etc.

All flatfish have, like flounder, plaice, chicken halibut, etc., a large flat bone running through the center, and when large they should be carved as indicated in Fig. 47.

1. Cut through to the bone from *a* to *b*.
2. Slip the knife between the flakes and the bone, then begin cutting at *c*, *d*. Slip the knife under the portion, and

place it on the plate without disturbing its form. Do the other half of the side in the same manner. The bone will now be exposed; lift it up and send it from the table. Serve the under part in small fillets, the same as the upper part is served.

When the fish is small, make four fillets of it,—that is, simply remove the top in two sections,—and when the bone is lifted serve the under part in two pieces.

CHAPTER XI

FOOD

Brief outline of the processes of digestion. Fruits. Fats. Principles underlying the cooking of albuminous substances. Principles underlying the cooking of vegetable substances. The manipulation of materials. Flavors and odors. Economy in food. Growth and repair. Heat and force. Vegetables with little or no starch.

The food question is a complicated one, and in dealing with it one must look at its many sides: (1) cost; (2) nutritive value of different substances; (3) seasons; (4) climate; (5) age; (6) occupation; (7) eccentricities of taste and digestion.

The object of providing food should be considered.

In providing food for any number of people, the object for which it is employed should be considered. Primarily the use of food is to supply material for the growth and repair of the animal body, and to give heat and vital force. Incidentally, among civilized humanity, it contributes largely to the social life.

Every housekeeper should have some knowledge of the change raw materials undergo in cooking.

Each meal should supply the proper elements for each of these requirements. Every housekeeper who would provide her family with food suitable for the maintenance of physical and mental vigor must know something of the principles of nutrition and digestion, and have some knowledge of the changes the raw materials undergo in cooking.

It is claimed that the ordinary housekeeper has not time to study these subjects. It is almost the work of a lifetime to master any one of the sciences, but any intelligent woman may learn the essential principles underlying the science of nutrition.

Market value does not indicate nutritive value

The market value of food materials does not, as a rule, indicate their nutritive value. For example, there is more nutrition in a pound of a flank of beef than in a pound of tenderloin from the same animal; yet the tenderloin will cost three or four times as much as the flank piece.

It must be remembered, however, that it often happens that food materials that are rich in nutritive qualities are difficult of digestion and require careful treatment to make them a satisfactory food.

Nitrogenous compounds and carbon compounds.

The most important food principles have been divided by scientists into two general divisions, and these are again subdivided. The two great divisions are comprehended under nitrogenous compounds and carbon compounds.

The nitrogenous compounds are absolutely necessary for the growth and repair of the living animal, and it is possible to live upon animal food alone. The carbon compounds give heat and force, but they alone cannot sustain life for any great length of time.

The nitrogenous compounds include albumin, fibrin, and casein. Lean meat, eggs, milk, and fish are the sources from which we get nitrogenous foods in the most concentrated and digestible forms. Some vegetable substances are rich in nitrogen, while others are almost destitute of this important element.

The carbon compounds include starch, sugar, fats, etc. Although these foods are not absolutely essential to life, they are of great value in supplying heat and energy, and are less exciting and more economical food than all nitrogenous materials.

The digestive organs of a human being provide for the digestion of both carbon and nitrogenous compounds, so that nature designed that all these elements should enter into the nutrition of mankind. It is essential, then, that the daily menu should consist of a proper proportion of these two great divisions and the phosphates and other inorganic salts and water.

The daily menu should consist of a proper proportion of these two great divisions.

Nitrogenous Substances are composed of four elements—carbon, hydrogen, oxygen, and nitrogen. They are also known as proteid substances, because protoplasm enters into the composition of the cells of the organism. Another name by which they are known is albuminous substances, because they belong to the series of substances of which the white of egg is taken as a type. Sometimes, too, they are called flesh-like substances, because the muscles of the body are composed of these four elements. These explanations are for the young people, who are so often confused by the multiplicity of names for the same thing. Nitrogenous substances are flesh-formers. This term is often used in dietaries. In nature nitrogenous foods are nearly always mixed with other food principles. In animal foods there is always fat, various salts, and sometimes sulphur and phosphorus. The casein of milk, the vegetable casein of pease, beans, nuts, etc., and the gluten of flour all come under the head of albuminous or nitrogenous substances.

The **Carbon Compounds** are composed of carbon, hydrogen, and oxygen. They are divided into two classes—carbohydrates and hydrocarbons.

Carbohydrates are so called because the hydrogen and oxygen are in the right proportion to produce water. This division of the carbon compounds includes starch, dextrine, gum, and sugar.

Hydrocarbons.—The fats belong to this group. They

contain more carbon than the carbohydrates, and hence yield more heat and force.

The carbon compounds are sometimes called combustible food, because they are burned in the body to produce heat and force.

Mineral foods which include water, lime, salt, etc., are essential.

Besides the nitrogenous and carbon compounds, there is another class of food that is essential to the health of all living animals and vegetables. These are the mineral foods, and include water, lime, salt, etc.

BRIEF OUTLINE OF THE PROCESSES OF DIGESTION

In the selection, preparation, and serving of the food the housekeeper and cook have a serious duty to perform. It is not sufficient that enough of some sort of food be given; it must be of the right kind, properly prepared, and, so far as it lies in their power, served in such a manner that it shall appeal to the eye and palate.

Housekeeper and cook should have some knowledge of digestion.

The manner of preparing, serving, and eating food has a marked effect on the digestive organs. Every housekeeper and cook should have a clear understanding of when, where, and how each food principle is digested, that in cooking the combinations and processes shall be such that some of the organs shall not be made to do double work. As a rule, the stomach is the overworked organ. The organs of digestion are the alimentary canal, and several sets of glands, which produce the digestive fluids.

The **Alimentary Canal** consists of five parts—the mouth, esophagus, stomach, small intestine, and large intestine. There are four digestive fluids—saliva, gastric juice, bile, and pancreatic juice.

The **Saliva,** which is formed in the mouth, acts on starch, changing some of it to sugar and dextrine.

Gastric Juice, which is produced by the lining membrane of the stomach, acts upon albuminous matter, and is thought not to act upon any other food principle.

Bile, which is one of the products of the liver, neutralizes the acidity of the partially digested food as it passes out of the stomach. It also acts upon the fats.

Pancreatic Juice.—This is the most important of the four digestive fluids, for it acts upon all the food principles.

The **Process of Digestion** is, briefly, this:

1. The food is ground to fine particles in the mouth, and in the process of mastication it is mixed with saliva, which acts on starch, but on no other substance. It is, however, a valuable aid in making the food pass through the esophagus with ease.

2. The food enters the stomach, and is rolled about by the muscular contraction of the coat of the stomach. In this way it is broken up, and every part brought in contact with the gastric juice. The gastric juice acts on albuminous matter, but on no other food principle. It dissolves the albumin in meat, bread, vegetables, etc., leaving the starch and fats free. Some of the perfectly digested food is absorbed in the stomach, but the greater portion passes into the small intestine in an acid, semi-liquid mass; this is called chyme.

3. The bile and pancreatic juice mix with the chyme, converting the starch into sugar, the fats into a fine emulsion, and dissolve any albuminous substance that was not digested by the gastric juice. This new product is called chyle, and is absorbed by the villi, and so passes into the circulation.

The necessity of thorough mastication.

From this brief sketch it will be seen that thorough mastication is necessary, that the starch may be acted upon by the saliva, and that the food shall be so finely divided that parts will separate easily and the gastric juice may begin its legitimate work at once.

When the food is not properly masticated the stomach

powers are wasted, in breaking it up, before the real work of digestion begins.

In the preparation of food the fact must be kept in mind that the gastric juice acts only on albuminous matter. If fats, starch, and albumin are so intimately combined that the stomach powers are taxed with the task of separating them, it will be putting a burden of work on this organ that will weaken it in time. It is for this reason that fried food, pastry, etc., are so difficult of digestion, especially when badly cooked. All albuminous food should be cooked so that the fibers are softened rather than hardened.

The gastric juice acts only on albuminous food.

Digestion of starch and fats.

Raw starch is hardly acted upon by the digestive fluids, and passes out of the system nearly the same as it entered. The more thoroughly it is cooked, the more easily it is digested.

Fat that has not been cooked, or that was cooked at a low temperature, as, for example, butter, oils, the fat on boiled meats, etc., are easily digested, if not taken in too large a quantity. Filling the stomach with liquids while eating dilutes the gastric juice and so weakens its action on food.

Conditions favorable and unfavorable to digestion.

Too much food in the stomach at once interferes with digestion. Excessive fatigue, anger, worry, anxiety, etc., all have a tendency to stop the flow of gastric juice, and hence interfere with digestion. It should be the duty and pleasure of every one to make the hours at table social, bright, and happy, and thus lay up a store of physical and mental health for the serious work of life.

FRUITS

With the exception of nuts, the nutritive value of fresh fruits is not great, but as a regulator of the system they are exceedingly valuable. Dried fruits, like dried vegetables,

are richer in nutrients than the fresh, but they do not have the same refreshing powers that the fresh, juicy fruit has. Fruits, when eaten under-ripe or over-ripe, disarrange the digestive organs.

Nearly all fruits are best when allowed to ripen on the tree or vine. Pears are an exception to this.

When best, and how they should be preserved.

Fruit keeps best in a cool, dry, dark place. It is necessary to examine stored fruit frequently, because decay is contagious.

Fresh fruits differ in their effects upon the digestive organs. For most people pears, apples, plums, and grapes are a laxative, while peaches and strawberries have an opposite effect. These properties are very much modified by cooking. Except fruit be ripe enough, and not over-ripe, it is in a more healthful condition cooked.

There are a few points in regard to fruits which every housekeeper should know.

The quantity of sugar and its effect on fruits.

Some fruits require very little sugar in cooking, while there are others that are very poor if a good deal of sugar is not used. Some of the fruits that require a good deal of sugar are strawberries, cranberries, plums, tart apples, currants, and gooseberries. The fruits that are better with only a very little or moderate amount of sugar are raspberries, blackberries, peaches, pears, quinces, etc. Nearly all fruits are of better color and flavor, and of a more tender texture, if the sugar is added when they are first put on to cook.

Method of cooking dried fruits.

Hard fruits, such as quinces, must be made tender in clear water before the sugar is added. Some fruits will be improved by long cooking, while others would be spoiled by this process. Fruits that will endure long, slow cooking will not as a rule require as much sugar as those that must be cooked quickly. The dried fruits, such as peaches, apricots, and apples, if cooked long enough, will require very little sugar. Prunes should

never have sugar added to them. Wash all dried fruit carefully, and cover generously with cold water. Let it soak overnight. In the morning put it on to cook in the water in which it was soaked. Add the sugar, if any is used, and cook slowly two or more hours. A good way is to put the fruit and liquid in an earthen dish which can be covered. Bake in a very moderate oven.

The proportions of water and dried fruit are, to one pint of fruit one pint and a half of water.

Prunes are better not soaked. Wash them one by one, then rinse in two more waters. Put them in a stew-pan, with a pint and a half of cold water to each pint of fruit. Let them simmer for two hours and a half. Turn them into a bowl, and set away to cool. They are delicious cooked in this manner.

FATS

Some fat is necessary to the maintenance of a perfectly healthy body. We get it in small quantities throughout the lean parts of meat, and in all good meat there is a generous layer of fat between the skin and the muscular parts. Some of this coating of fat should be left on the meat when it is put on to cook.

I think that, as a rule, we do not attach enough importance to the temperature at which we cook fats, nor do we know enough about the temperature at which the different fats will burn or be so changed as to be irritants in the digestive organs.

Importance of temperature at which fats are cooked.

It is safe to say that the lower the temperature at which a fat can be cooked and have the flavor developed, the more easily it will be digested. We all know how cooking changes the flavor of butter, several of the volatile acids which contribute to its flavor being broken up and driven off.

The flavor of the ordinary fats is improved by proper cooking; but if the temperature be raised too high, an irritating, fatty acid is developed, as witness the difference between a delicate brown, crisp piece of fat on a roast and the disagreeable acrid flavor of the fat which has been subjected to a high temperature.

When there is water mixed with fat it cannot be raised to as high a temperature as if the fat were pure. It is for this reason that we put water in the dripping-pan, and baste the meat frequently with the mixture of water and fat. This keeps the temperature of the surface of the piece of meat lower than it would otherwise be, and the digestibility of the roast is infinitely greater than it would be if it were basted with the clear hot fat that dropped from the meat.

Water mingled with fat keeps the temperature low.

In all kitchens more or less frying is done, and it is important that it should be done properly.

Putting a substance to cook in a pan with half an inch or more of fat is the most unhealthful and extravagant mode of cooking. The portions of the food that are exposed to a current of air are kept at such a low temperature that they absorb the fat.

How to fry easily, economically, and healthfully.

To fry economically, healthfully, and with the least possible amount of work, it is necessary to have fat enough to immerse the article. Then, too, it is essential that you know the qualities of the fats and make a proper selection; and, again, that you know the temperature at which different articles cook and at which the different fats burn.

The purer the fat—that is to say, the more oil there is in it—the higher the degree to which it can be raised without burning.

Butter burns at the lowest temperature, and olive-oil at the highest.

Here is a table of the burning-points of the fats most commonly employed for frying purposes:

	F.
Butter	266°
Beef, veal, and mutton suet	302°
Drippings, *i. e.*, the fat from soups, roasts, etc., clarified	336°
Goose-grease	500°
Lard	392°
Olive-oil	608°

Temperature at which different fats burn.

It will be seen from this table that butter is the poorest material, and olive-oil the best, for frying purposes.

How to clarify butter.

Butter can, by clarifying, be made to stand a higher temperature than 266°. This is done by heating the butter slowly, skimming it, and letting it rest on the fire until the casein has coagulated and fallen to the bottom, then pouring off the clear oily substance. The French prepare their butter in this manner for sautering and frying. Salt raises the temperature and causes the butter to burn. It should be washed out of butter that is to be used in sautering or frying. The French mix lard with butter for frying purposes.

It will be seen that, next to butter, the suet from beef, mutton, and veal burns at a low temperature.

Drippings, because they are the most liquid parts of the fats of roasted and boiled meats, have a larger proportion of oil than either suet or butter, and therefore burn at a higher temperature. A combination of drippings and lard is the most satisfactory. Many persons object to lard on the score of its being a product of pork; but it is certainly more healthful for frying purposes than the suets, because it can be heated to a higher temperature, searing the article at once, and thus giving a food comparatively free from grease.

In heating fat for frying, one must always consider the

nature of the article to be fried. For example, a temperature that would be right for breaded fish, oysters, or croquettes would burn the outside of doughnuts, fritters, or any batter, while the inside remained raw. Again, it must be remembered that a very cold or watery article will lower the temperature quickly, and only a small portion should be put in at a time.

The nature of the article to be fried must regulate the temperature of the fat.

This is especially true of fish, because some of the water escapes into the fat during the cooking.

When frying fish, fish-balls, egg-plant, or any watery article, it will generally be found that after the second batch has been cooked the fat will be full of bubbles of steam, and will no longer fry an article crisp and brown. The fat must be kept hot until every particle of water has evaporated. Then it will do its work as well as ever.

If one attempts to fry in fat that is saturated with water, the product will be a grease-soaked article, which is not fit for the stomach of man or beast.

Great care is required to keep fat in a good condition. Here is a rule that, if followed, will secure good results:

Rule for care of frying fat.

1. The moment you have finished frying, set the kettle back in a cooler place; do not wait an instant.

2. If water gets into the fat, cook it gently until all motion ceases.

3. If the fat gets too hot before you are ready to use it, put in a handful of raw sliced potatoes.

4. If there is a good deal of foreign substance in it, add two or three raw potatoes cut in slices.

5. When cool, but still in liquid, strain through cheesecloth.

6. Keep a separate fat for fish.

How to Determine the Temperature of Fat.—1. For all breaded meats, a faint blue smoke rising from the center,

and a suggestion of a movement on the surface; it is like a pencil-mark.

2. For fried potatoes, a very little stronger smoke.

3. For fish and watery articles, a still stronger smoke.

How to Use the Various Kitchen Fats.—In all kitchens there is a certain amount of fats which must be disposed of in some way.

How to use the various kitchen fats.

All the fat from beef, veal, pork, and chickens can be used in cooking. They should be rendered carefully, not allowing them to get too hot. Strain them through cheese-cloth, and keep for use in frying or in preparing many of the soups or ragouts that call for butter.

The fat from bacon, ham, and sausages can be used for frying potatoes and hominy. These fats can be used instead of butter in some of the savory sauces made for vegetables.

The fat from mutton, lamb, turkey, duck, and goose goes into the soap-grease, being too strong-flavored to use in cooking.

It is well to have a cake of mutton tallow to use on chapped hands and on rusted articles, and also to save a bottle of clear goose-oil to use in case of sickness.

How to clarify fats.

All fats used for frying should be thoroughly clarified. To clarify fat, keep it at a gentle heat until there is not a bubble to be seen, and all sediment has fallen to the bottom, leaving a clear oil. Strain this, and keep in a dry, cool place.

If the fat which has been used in frying has become dark, put it in a stew-pan with several quarts of water, and heat it to the boiling-point; then pour it into a large pan, and add several quarts of cold water. Set in a cold place. When the fat has formed in a cake on top of the water, take off and put into the frying-pan. Heat gently, and cook until it has ceased to bubble and the sediment has fallen to the bottom. Partially cool, and strain. Remember that as

long as there is a bubble there is water, and the fat will not answer for frying while it contains water, nor will it keep well.

Solid pieces of fat, like the trimmings of beef, mutton, veal, pork, etc., should be cut in small pieces and rendered with a gentle heat.

Take as much care in rendering and straining the soap-grease as that for cooking purposes.

Mutton fat makes the hardest and whitest soap, but all kinds can be used.

To sweeten rancid butter.

Butter absorbs odors more readily than any other fat. Owing to the water, buttermilk, and other substances left in it, it often becomes rancid. If the butter be thoroughly washed in lime-water, and then rinsed in clear water, it will become sweet again. Sometimes a little chloride of lime is used instead of quicklime.

PRINCIPLES UNDERLYING THE COOKING OF ALBUMINOUS SUBSTANCES

Albuminous matter is of various kinds, and is found in animal and vegetable substances. In their natural condition some of the albumins are liquid, some are solid, and there are others that have a consistency between the two.

Coagulation is one of the properties of albumin. Different kinds of albumin solidify under different conditions, but heat has the power of coagulating nearly all albuminous substances.

The coagulation of albumin.

Only a small portion of the casein of milk coagulates when subjected to heat; but if the milk be heated to 100° and an acid is added, it will coagulate, as is the case when we make rennet custard. This solidified mass will be soft, creamy, and digestible.

If the milk is raised to the boiling-point, and the acid

added, the albumin will be coagulated, but the product will be quite different from that obtained by adding the acid to the milk at 100°. The higher temperature hardens the albumin, which separates from the water, thus giving a curd and whey. The longer the cooking is continued at this high temperature, the tougher the curd will become, and the clearer the whey.

The fibrin in the blood coagulates on exposure to the air, and also when subjected to heat. The albumin in lean meat and in the white of an egg coagulates on exposure to heat.

Albuminous substances, when cooked at a temperature below the boiling-point, will be soft and digestible. When cooked at a temperature of 212° or higher, the albumin becomes hard and indigestible. The purer the albumin, the more marked is this condition.

Milk and eggs taken to show the effect of temperature on albumin.

To illustrate this, we will take milk and eggs. When we make a curd and whey, we always find that the curd made with skim-milk is much tougher than that made with whole milk; if a little cream is added to the milk the curd will be still softer. Thus cheese made with skim-milk is hard; that made with whole milk is richer and softer; and that made with whole milk and some cream is still softer.

We boil an egg hard, and break it up. The white will be hard and horny, while the yolk will be light and crumbly. The white of an egg is almost pure albumin, while the yolk contains nearly twice as much fatty matter as it does albumin; hence it does not harden into a solid mass like the white.

Albuminous substance in lean meat is always mixed with fatty matter, and the more fat there is, the less hard will become the albumin when exposed to a high temperature. It must be remembered, however, that the fat in the yolk of an egg and in milk is in the form of an emulsion, while in lean meat it is in separate layers.

The effect of cooking upon meat is to coagulate the albumin and fibrin, and to gelatinize the tendons and connective tissue, and it also develops flavor.

The tendency of albuminous substances to fermentation and putrefaction.

Two other characteristics of albuminous matter are the tendencies to fermentation and putrefaction. The conditions necessary for these changes are heat and moisture. When the temperature reaches 200° or more, fermentation or putrefaction ceases. I do not know at what point below 200° fermentation or putrefaction begins, but I am quite sure that it would not be safe to keep any animal substance for several hours in a closed vessel below 170°. I speak of this matter now, so that when the question of slow cooking comes up, it may be fully understood that it must not be too slow.

The effect of heat on albuminous as on all other substances is not only to effect a change in the texture, but also in the flavor. As a rule, the higher the temperature, the more pronounced the flavor. This development of flavor is quite important, as it makes the food more appetizing, and one should aim to cook at such a temperature that the best flavors shall be developed, and yet that the albuminous substance shall not be made hard and indigestible.

Test to show effect of temperature on texture and flavor of albumin.

To show the effect of heat on nearly pure albumin, let us take three fresh eggs and cook them at different temperatures.

Have a deep saucepan that will hold one pint or less. Put one egg in the cold saucepan, and pour over it half a pint of boiling water; cover and place on a board or paper, away from the fire, for ten minutes. In a few seconds the cold saucepan and the egg will have absorbed twenty-two degrees of heat from the water, leaving it at 190°, and of course the temperature will continue to fall in the ten minutes that the egg is cooking.

Have a second saucepan, in which boil half a pint of

water; put an egg into this boiling water, and immediately place the saucepan, covered, by the side of the first. In a few seconds the temperature of the water will have fallen to 200°, the egg having absorbed twelve degrees of heat. Let this egg cook ten minutes.

Put the third egg in a saucepan of boiling water, and let it boil for ten minutes. Then open all three eggs and put them on a plate. Examine the texture, then taste for the flavor, using butter and salt, if you like. All three eggs were cooked ten minutes. One stood after a few seconds with a temperature of 190°, which continued to lower until the egg was removed from the water. The white of this egg is a thick, soft curd, the yolk very liquid. There is not much flavor, except a suggestion of rawness. The second egg, that was dropped into the boiling water which fell after a few seconds to a temperature of 200°, has a pleasanter flavor, the white is firmer, but it breaks up into a soft mass under slight pressure; the yolk is slightly thickened. This is an ideally soft-cooked egg. The third egg, which went into the boiling water and boiled all the time (212°), is what is commonly called a hard-boiled egg. The white is a smooth, hard mass; being almost pure albumin, there is nothing to keep its particles soft when exposed to the temperature of boiling water. The yolk of the egg is firm and mealy.

This experiment teaches us (1) that pure albumin coagulates at a low temperature (the average is about 165°), but that little flavor is developed; (2) that at a little higher temperature (average about 180°) the albumin, although a little firmer, is still soft and digestible, and is better flavored; (3) that when cooked at a temperature of 212° or more the albumin becomes hard, horny, and indigestible.

If all albuminous substances which we cook were as free from admixtures as the white of egg, we could say that the temperature for cooking should be 180°. But we have few substances which are thus pure.

In cooking meat, it must be remembered that, besides the albumin, we are dealing also with tendons and connective tissue (see "Muscular Fiber"), which require a higher temperature to soften and dissolve them. About 202° gives the best result as to the texture and tenderness of meat cooked in water.

What to remember in cooking meats.

When a bubble of air or steam darts up from the bottom of the stew-pan every few seconds, the temperature of the water is at about 202°. This is called gentle simmering, or, as the French say, a "modest smile." All boiled or stewed meats should be cooked at this temperature. This rule applies to all salted meats, such as beef, pork, hams, tongues, etc., all fresh meats, poultry, and fish.

Gentle simmering.

In roasting, broiling, braizing, etc., all meats should be cooked as near as possible at the simmering temperature. It is important, however, that fresh meat or poultry should be hardened on the surface, that the juices may be retained in the meat. To do this there must be a high temperature at first. As soon as a thin crust is formed the temperature should be lowered.

General rules for roasting, boiling, broiling, etc.

All animal and vegetable food is more healthful when cooked in such a manner that some of the gases which are formed in cooking may pass off; therefore the stew-pans should never be covered closely.

In roasting, the piece of meat should never rest on the bottom of the pan. A steel or wire rack should be placed in the pan, and the meat should rest on this. Meat should never be basted with the clear hot fat that drops into the pan; a piece of meat that has been saturated in this manner with hot fat must be indigestible. Always have a little water in the pan to mingle with the drippings. The water keeps the temperature of the fat low, and meat cooked in an oven is improved by being basted with such a mixture. If the

foregoing principles are fully understood, and the following general rules are followed, one can be sure of having all animal food as tender and succulent as the quality of the meat will admit.

NOTE.—If a ham be taken from the boiling liquid and plunged at once into cold water,—ice-water is best,—the fat hardens white and firm, giving the meat a fine color.

Boiled Meats.—Put the piece of meat or poultry into boiling water, and boil rapidly fifteen or twenty minutes; then place the stew-pan where the water will bubble gently until the meat is done. The time of cooking depends upon the kind of meat, the toughness, etc. Fresh beef, when required to be well done, should cook about five hours; corned beef, tongue, ham, five hours. Should the piece of beef or ham weigh over ten or twelve pounds, allow an extra hour; it will take an hour for the heat to penetrate to the center of a large, solid piece of meat. For fresh meat that is to be served rare, like mutton and beef, the time depends upon the shape; a thin piece requires less time than a thick piece. A leg of mutton weighing ten pounds will be cooked rare in an hour and a half; medium well done in two hours.

Fowl not very old will cook in an hour and a half; but a tough one may take two or three hours. A turkey weighing ten pounds should cook three hours and a half.

The cover of the saucepan should be drawn a little to one side, all through the cooking, to allow the escape of steam and gases.

Hams, tongues, corned beef, and poultry, that are not to be served hot, are all improved by partially cooling in the water in which they were boiled. The saucepan must be set in a cool place (in a current of air, if possible), and the cover must be removed. The more rapidly and thoroughly the cooling is done, the better the meat and broth will keep.

Roasting.—Have the meat exposed to a high temperature for the first half-hour, then reduce the heat. It must be

remembered that when meat or any other substance is cooked in a liquid which covers it, the temperature of the article being cooked is always that of the liquid in which it is cooking. In roasting and broiling, the waves of heat are always being diluted with air at various temperatures. This must be taken into account when cooking in the oven, or before, over, or under the fire. It would not be possible to roast perfectly in an oven that registered 202°. The temperature should be about 350° when the meat is first put in. As soon as the meat is browned on all sides the temperature should be lowered by the closing of the drafts, and, if need be, the opening of the checks; but, as a rule, the closing of the drafts will be sufficient. Basting the meat frequently with the drippings in the pan will drive the heat to the center and make the meat juicy.

Temperature more constant in liquid than in air.

Broiling.—The same principle must be applied to broiling as to roasting: first great heat to sear the surface, then slow cooking. A steak or chop cut an inch thick should cook for two minutes close to the fire, then eight minutes drawn a little distance from the fire. The meat must be turned frequently. This time and method give a steak or chop of medium rareness.

Stewing and Braizing.—All meats stewed and braized should be treated like boiled meats: first great heat, then a gentle simmering.

Frying.—The least objectionable and most economical method of frying is to immerse the article to be cooked in a bath of hot fat. Frying is the least healthful of all methods of cooking, and should be employed sparingly.

Fish.—The principles underlying the cooking of meats are the same for fish. Salt fish should *never boil.*

Mutton should always have the thin skin that comes next to the fat removed before cooking, as this is what gives the strong, disagreeable flavor to the meat.

PRINCIPLES UNDERLYING THE COOKING OF VEGETABLE SUBSTANCES

The vegetable foods are divided into four general classes—cereals, legumes, tubers, and green vegetables.

Cereals.—Under this head are included all the grains—wheat, oats, rye, barley, Indian corn, rice, etc.

Legumes.—Pease, beans, and lentils belong to this class.

Tubers.—To this class belong potatoes, turnips, carrots, beets, parsnips, etc.

Green Vegetables.—The leaves, stalks, and green, tender pods of vegetables come under this head.

Vegetable Fruits and Flowers.—Cucumbers, squash, egg-plant, tomatoes, etc., are sometimes called vegetable fruit. The flowers of some vegetables, such as cauliflower and French artichoke, are the parts of the vegetable used.

Vegetables vary in their composition, some having a large proportion of water, while in others it is small. In green and moist vegetables the percentage of water is high. In the cereals and legumes it is low.

Vegetables that do and do not contain starch.

Starch goes to make up a large percentage of some vegetables, while others contain none. All the cereals, legumes, potatoes, etc., belong to the first class. Carrots, turnips, onions, Jerusalem artichokes, beets, and tomatoes belong to the second class. In nearly all the plants that contain starch there is also found a slight trace of dextrine. Small as is the amount of dextrine, it exercises an influence on the flavor of properly cooked starchy foods.

The starch in a plant consists of granules, which are enveloped in a thin membrane. No matter how fine the flour may be, a large proportion of the starch grains are still protected by this membrane, which must be broken before the real cooking of the starch begins. Moisture and a high

temperature are necessary to the perfect cooking of starch. Potatoes, green corn, and other moist vegetables supply the moisture for cooking their starch; but the dry cereals and legumes must be supplied with the necessary moisture. The effect of heat on starch is to swell the grains, causing them to burst through their thin sacks. A good illustration of this is pop-corn.

Effects of cooking on starch.

If there is a plenty of moisture the starch grains absorb it, as, for example, when a starchy substance is first put into a boiling liquid it begins to thicken immediately, provided the substance is ground fine, as in the case of corn-starch; if the cooking is continued for twenty minutes or half an hour, with the cover on the stew-pan to prevent evaporation, the mixture grows thinner rather than thicker—that is, the starch becomes dissolved and grainy; when subjected to long cooking at a high temperature, a portion of the starch is changed into dextrine, then sugar—hence the sweeter taste in well-baked bread or any starchy substance when subjected to long cooking at a high temperature. Some kinds of starch become more transparent than others when cooked; this is notably the case with arrowroot.

When starch is subjected to a temperature of 320° or more, some portion of it is changed to dextrine, and this, in turn, is changed to sugar, if the cooking is continued long enough, under the right conditions. For example, when we make a cream sauce by first cooking flour in hot fat, and then adding milk to it, if the sauce is used at once it will be smooth and free from a sweet taste; but let it cook for some time, and it becomes sweet, as if sugar had been added to it. When there is a trace of dextrine in the starchy food, as is the case in wheat, potatoes, etc., the long cooking changes the dextrine to sugar, thus giving a peculiar nutty flavor to bread, mush, and vegetables.

The digestive juices have little action on starch in the raw

state; if taken into the system in that form, it causes derangement of the alimentary canal, and the greater part passes out unchanged. So it is very important that this substance be properly cooked, that it may be palatable and digestible.

NOTE.—Church says: "It has been found that uncooked starch from Indian corn may be completely turned into sugar by the action of the saliva in 3 minutes, oat-starch in 6 minutes, wheat-starch in 40 minutes, and potato-starch in 3 hours, the quantities, etc., being the same in each case. But after thorough cooking, all starches require nearly the same time."

Flour, corn-starch, etc., cook much quicker than the coarser meals. This is because the starchy particles are broken up so much finer that the heat and moisture reach them quickly. It is for this reason that Graham bread must cook so much longer than the loaf made with fine wheat flour. A mush or gruel made with fine flour will cook in much less time than that made with the coarser meals.

All cereals should be stirred into boiling water, and they should boil. Salt should not be added at first, because it hardens the cellulose or woody envelops. When cooking starchy foods it is important that one should know what result is desired at the end of the process. For example, do we want the article cooked just long enough to swell and burst the starch granules, or do we want the process to go further and change the character of the article from a comparatively light, dry mass to a moist, gummy one?

Conditions which produce a light, dry, or a moist, gummy article.

We have seen that the first effect of heat on the starch granules is to make them swell and burst through their envelop. When we cook potatoes, rice, pop-corn, dumplings, etc., the aim is to have these dishes light and dry; therefore the cooking should stop as soon as the starch granules have burst. If the cooking continues in moisture, the starch

absorbs the moisture and the article becomes soggy and heavy. If, on the contrary, we want the starch to dissolve, we cook it a long time in plenty of liquid, as when we bake a little rice and a great deal of milk together for two or three hours. The result is a thick, creamy, delicious mass.

The ideal bread.

Among the varieties of vegetable food, the most important are the cereals, and of all the cereals wheat is the most valuable. It has the largest proportion of nitrogenous principle of any of the grains commonly used in bread-making. In the form of properly made and baked bread, wheat gives one of the most healthful and satisfying nutriments. There are hundreds of methods of making bread, and the different forms and textures give a pleasant variety; but taken day after day and year after year, there is no form of bread which is so satisfactory as the loaf that is made with flour, water, salt, yeast, and possibly a little butter to make it tender, and also a little sugar to help fermentation. A tablespoonful of sugar to four quarts of flour will be sufficient for this. The fermentation should go on only long enough to make the bread so light as to break up readily in mastication. The loaves should be in such a form that the heat will penetrate to the center readily and quickly, and each loaf should be baked long enough to cook the starch thoroughly and give a rich brown, nutty-flavored crust. The secret of the French bread lies in the fact that the dough is worked without the use of much dry flour; it is not allowed to rise much; the loaves give as much crust as crumb, and they are baked in well-ventilated brick ovens until a rich, thick crust is formed. However, the French loaf is good only the first or second day; this is because the kneading is not enough to make the dough smooth and fine-grained. The more dough is kneaded, the finer and closer grained will be the loaf; the bread will be more tender and will keep soft longer than a loaf which has had but little kneading.

The leguminous seeds, such as beans, pease, and lentils, are richer than any other vegetables in nitrogenous principles, and, with the addition of fat, they may take the place of meat in the dietary, but unless cooked with care are quite indigestible. No matter what the mode of cooking, it must always be rather long and at a low temperature. This is true even of the fresh or green beans; still, when fresh, the time for cooking should not be more than one third or one half of that required for the dry bean. Pease, when dried, require long, slow cooking, but when fresh-picked will cook quickly. Lentils require about the same treatment as dried beans. The dried beans and pease, pound for pound, are much richer in food values than the fresh vegetables, but require great care in cooking, that the tough skin may be made tender. The French prepare these vegetables in purée, that they may be more easy of digestion by the removal of the tough envelops.

Legumes—their nutritive value.

Fresh beans and pease should be cooked in boiling water, and boiled gently, with the cover partially off the saucepan to allow the steam to escape. They should not be allowed to over-cook. The time of cooking will depend upon how young and fresh they are.

Dried beans and pease should be soaked in cold water for eight or more hours. They should be rinsed in fresh water, and put on to cook in cold water. They should simmer gently, with the cover partially off the saucepan, until they are tender. Rapid boiling, with the cover on the saucepan, removes and hardens the outer envelop, breaks up the beans, and produces a dark, strong-flavored, indigestible vegetable. If a little washing-soda is added to the water in which dried beans or pease are soaked, the strong flavor will be partially removed and the vegetable will be more tender. Use a piece of soda about the size of a pea for each quart of water.

How to cook dried beans and pease.

Tuberous Vegetables.—Nearly all vegetables of this class are watery. Some have a good deal of sugar and no starch, while others, as the potato, contain a great deal of starch. All these vegetables should be washed very clean, and pared or scraped. If potatoes are liked cooked in their "jackets," they should be pared at the ends, and a narrow strip of the skin taken from the middle of the potato. This is to allow the gases to escape. Baked potatoes, if pierced when half done with a sharp fork or skewer, will be more digestible than if an outlet were not made for the gases to escape.

Carrots, parsnips, and salsify should always be scraped, never pared. In old carrots the heart is hard and woody, and unfit for food; only the tender outside layer should be used. In new carrots the heart is tender, and should be used. It is important that all these vegetables should be cooked until tender, but no longer. Over-cooking causes them to become strong-flavored and indigestible.

Green Vegetables.—Green vegetables have not the nutritive value found in the grains and most of the tubers, but they are valuable because of the phosphates and other salts and acids which they contain, and which the human body demands. They also fill an important part in the human economy by supplying a food which dilutes, as it were, the more highly concentrated foods, such as meats, fish, eggs, etc. If it were not for the use of the vegetables, we should eat too much of the more stimulating foods. Finally, the variety which they supply to our tables is one of their chief blessings.

How the French cook fresh vegetables.

Fresh vegetables require great care in their preparation, that they may be made digestible, and yet retain the greater part of their mineral constituents. The French people are much more scientific in their preparation of fresh and green vegetables than we are. Where it is possible, they cook them in very little or no water. They blanch nearly all green vegetables before

proceeding with the cooking proper. This is done to remove any strong or bitter taste, and to make green vegetables greener, and the white or light tubers whiter.

How they are blanched.

The vegetables are cleaned, well washed, and drained. They are then put into a stew-pan full of boiling water, and boiled for more or less time, depending upon the vegetable. The vegetable is then poured into a colander, and cold water is poured over it. Then the cooking proceeds. Usually spinach, lettuce, sorrel, etc., are put in a thin piece of cloth, and the water is pressed from them. They are then put back on the fire, with butter and seasonings and sometimes a little bouillon, and are simmered gently until done—spinach about half an hour.

For such vegetables as carrots, turnips, celery, onions, etc., a sauce is often made in which they are simmered. Sometimes these vegetables are first glazed, that is, fried in butter until brown; then a little sugar is added, and they are cooked a few minutes longer. This gives a rich-flavored and savory vegetable.

Sautered vegetables.

Many of the tuberous vegetables, when new and fresh, are cooked without any liquid. The small new potato is pared and washed, then put in a broad-bottomed stew-pan, with butter or some other fat, and cooked over a moderate fire until done. The new potatoes, which are about the size of a large marble, cook in about twelve or fifteen minutes; the stew-pan is often shaken to turn the potatoes. Young carrots are cooked in the same manner, except that they are sliced, and butter, sugar, and salt are added to them. It is a delicious dish, and extremely healthy. Turnips are cooked in the same manner. Young green pease are cooked with tender leaves of lettuce, salt, pepper, butter, and sugar. Small white onions and fine herbs are sometimes cooked with them. When the pease are not so tender, or are canned, a little water or bouillon is added to them, barely enough to cover them.

The French cook uses a great deal of butter in the cooking of vegetables. Sometimes sweet drippings are substituted, and, again, a little fresh pork is employed. The most delicious soups are made with a combination of vegetables, herbs, water, butter or other fat, and salt and pepper. There is hardly a vegetable which is not used, either cooked or raw, in salad, the usual dressing being one third or fourth vinegar, and two thirds or three fourths oil, with, of course, salt and pepper. For the bean salads, mustard is sometimes used. When it is possible, the French housekeeper has her little dish of garniture for her salad, which consists of *cerfeuil* (chervil), parsley, *ciboule* (a young onion), and tarragon. This garniture is added to the vegetables before the oil and vinegar.

Time of cooking green vegetables somewhat dependent on freshness and tenderness.

It is not possible to give the exact time for cooking fresh vegetables, because so much depends upon the vegetable itself, the time it has been picked, the degree of maturity, and whether it grew quickly or slowly. We all know that in cold seasons asparagus and corn are both hard and unsatisfactory, for these two vegetables demand quick growth to be tender. In a hot, dry season pease, beans, and nearly all the green vegetables are rather hard and tough. The slow growth that comes from a cold season makes these vegetables also less tender. Vegetables that have been picked long enough to wilt will not be tender unless the freshness and crispness have been restored by the use of cold water. Lettuce and asparagus can be kept fresh by standing the root ends in a pan of cold water. All herbs should have the stem ends placed in cold water. Potatoes, turnips, carrots, string-beans, spinach, and other green vegetables can be made crisp and fresh by soaking in cold water for several hours.

All fresh vegetables should be perfectly crisp before being put into boiling water. The water should be boiling

when fresh vegetables are put into it, and kept boiling gently all the time the vegetable is cooking. If the stew-pan is only partially covered, the vegetables will be greener and of better flavor than if covered closely. Too long cooking darkens the vegetable and makes it strong-flavored. Turnips, cabbage, and cauliflower are good examples of this. The small white turnip or cauliflower cooked over thirty minutes immediately begins to take on color and flavor; and if the cooking is extended to double that time, as is often the case, by careless people, the vegetable becomes indigestible. If potatoes are cooked two or three minutes after they are done, particularly if they are surrounded by moisture, either of their own or from some other source, they begin to grow soggy and strong-flavored. As great care is demanded that the vegetable should not be over-cooked as that it is not under-cooked.

Necessary condition of fresh vegetables before cooking.

Over-cooking ruins a fresh vegetable.

The supply and quality of our vegetables improve each year. Market-gardeners make a better selection of seeds, and bestow more care on the cultivation and marketing of vegetables, than was their custom. Small, almost stringless beans and fresh carrots are to be found in the markets all the year, where formerly they were to be had only a few months in the year.

A few definite rules will serve to show how easy, healthful, and satisfactory is the scientific method of cooking vegetables of the various classes. If the housekeeper and cook will take the time to thoroughly study and understand the principles underlying the cooking of vegetable substances as given in this chapter, our tables will be served with savory, digestible vegetables every day in the year. I feel like asking, as a personal favor, that each housekeeper will give for one year as much time to the study of vegetables as she ordinarily gives to the study of cakes, pastry, and other sweets.

A plea for more attention to the preparation of vegetables.

String the beans, and break them in pieces about two inches long; let them stand in cold water for several hours; drain off the water, and put the beans into a stew-pan with three quarts of boiling water; boil for thirty-five or forty minutes, with the cover partially off the stew-pan; then turn the beans into a colander, and pour cold water over them until they are thoroughly chilled. Put them in a stew-pan with the butter, sugar, salt, and stock or water; let them cook rapidly, with the cover off the stew-pan, for ten minutes. For one quart of beans, use (after they are blanched) two tablespoonfuls of butter, one teaspoonful of sugar, one teaspoonful of salt, and half a pint of light meat stock or of water. Or the water may be omitted, and a third tablespoonful of butter added; cook over a very hot fire for five minutes; this gives glazed beans. Or they may be heated and served in a white or brown sauce. If a tablespoonful of salt is added to the water in which the beans are boiled, they will be greener, but not quite so delicate and tender.

General rule for certain method of cooking vegetables.

The beans may be boiled hours, or a day, before the time of serving. The important thing to remember is that they must be chilled as soon as they are taken from the fire.

Spinach, lettuce, sorrel, cabbage, cauliflower, turnips, carrots, parsnips, and like vegetables may all be cooked in boiling water, chilled in cold water, drained, and put away until serving-time, when they may be heated and served in sauce, or sautered with the butter and salt, as directed for beans. The sugar may be omitted from beans and other vegetables, if not liked.

The secret of success in this cooking is in having the vegetable crisp, put into boiling water, having it boil continuously, with the cover of the stew-pan partially removed to allow the escape of gases, and the rapid and thorough

chilling of the vegetable as soon as it is taken from the boiling water.

If a vegetable is to be served immediately, the chilling is not necessary. If the vegetable is to be served in a sauce, the water in which it is boiled must be salted, as the sauce should not be salt enough to season the vegetable.

Boiled Potatoes.—Have the potatoes pared, or partially pared; cover them with boiling water, and let them cook, with the cover of the stew-pan partially off, for thirty minutes. Add one tablespoonful of salt for every dozen potatoes. At the end of thirty minutes drain off every drop of water; set the stew-pan on the range for a few minutes to dry off the potatoes. Never put the cover over the cooked vegetable. If the potatoes must wait before serving, cover them with several folds of cheese-cloth, and let the stew-pan stand on a warm part of the range. The cheese-cloth allows the moisture to escape, and yet protects the vegetable from the cold air.

Boiled Rice.—Wash the rice, rubbing the grains between the hands, in three waters. Put it on to cook in boiling water (two quarts of water to half a pint of rice). Add one tablespoonful of salt; boil rapidly, with the cover off the stew-pan, for fifteen minutes; turn the rice into a colander to drain. Immediately return it to the stew-pan, which cover and set back where it will keep hot for forty minutes or longer. Rice cooked in this manner will be sweet, dry, and have every grain separate.

The rice may be boiled in the water for thirty instead of fifteen minutes, in which case it must be thoroughly drained, then placed in the stew-pan on the back of the range; cover with cheese-cloth to allow the steam to escape.

By the first method the rice is only partially cooked when the water is drained off. The saucepan is then covered closely to prevent the escape of the moisture, which is required to finish the cooking of the vegetable. By the second method

the rice absorbs all the water it requires in the thirty minutes; therefore it must be thoroughly drained, and while drying off it must be covered with a coarse cloth, or with cheesecloth, that the steam may escape.

These examples of cooking potatoes and rice are given to show how necessary it is that there be only the required amount of moisture when a starchy substance is to be cooked dry. On the other hand, when a starchy substance is desired moist, the cooking must be done in plenty of moisture and at a high temperature.

High temperature develops fine flavor in cereals.

In cooking the various cereals in the form of mush, they should always be stirred into the required amount of boiling water, and boil for at least ten minutes. If there is fear of scorching the mush, the cooking may be finished over boiling water; but a fine nutty flavor is attained by mush which is cooked at a temperature high enough to let it bubble all the while it is cooking.

THE MANIPULATION OF MATERIALS

Necessity for understanding the reason why.

There are two forces that enter into the preparation of our food—the mechanical and the chemical. To do our work with the greatest ease and success we should understand the reasons why; then there will be no guesswork or uncertainty, and there will be a uniformity in our results which will be most gratifying. So far, when we have touched upon food, it has been to show the effect of heat on the simpler materials. Now we want to consider briefly manipulation, heat, air, steam, and gases in relation to certain kinds of mixtures.

In preparing certain mixtures the manner of combining and manipulating materials is very important. A few brief statements will help the housekeeper and cook to understand the reason why one gets such different results from the same materials under varying manipulations and conditions.

Doughs.—These are a mixture of flour or meal, liquids, and other materials. Anything that is made so thick that it can be molded into various forms is a dough. The more thoroughly a dough is kneaded or beaten, the finer grained will be the article made from it. The less moisture there is in dough, the drier and more crumbly will be the cooked article. All dough mixtures depend for their lightness on carbonic-acid gas, air, and moisture. The heat applied in cooking expands the gas, the air, and the moisture which has been changed to steam. The more air we beat into a dough, the less carbonic-acid gas will be required to make it light. In cooking, because of the greater pressure required to force the solid particles apart, all doughs, except where yeast has been used, require a greater heat than do the batters.

What makes dough light, fine-grained, and moist or dry.

Batters.—Mixtures of flour, meal, liquid, and other substances that are too thin to be molded into shape, are termed batters. Like doughs, they depend for lightness on air, moisture, and sometimes carbonic-acid gas. The thicker the batter, the greater the force required to push the particles apart.

The carbonic-acid gas which we employ to make doughs and batters light is produced in several ways. One is by fermentation, as when we mix yeast with the dough or batter; as the mixture ferments, particles of gas are given off, which become entangled in the dough, filling it with cells, and causing it to expand as a dry sponge does when placed in water. It is important that the dough be thoroughly kneaded or beaten, that the gas may be evenly distributed, thus giving a fine-celled loaf of bread, roll, or muffin. Articles of food that are made light with yeast must have all the cells formed, and the fermentation nearly finished, before heat is applied, because a high temperature kills the yeast plant and so stops fermentation.

Sources of carbonic-acid gas.

Carbonic-acid gas may be produced at the moment it is required for use by a combination of an acid, an alkali, and a liquid, as in the case of soda and cream of tartar or baking-powder; or with an alkali and an acid liquid, as, for example, soda and sour milk, vinegar, lemon-juice, molasses, etc.

When and how the gas is liberated.

The cook should remember that the gas is liberated at once when the wet acid and alkali are combined, except in the case of soda and cream of tartar, or a cream-of-tartar baking-powder. When the acid employed is cream of tartar, but little gas is given off until heat is applied. This may be proved by putting equal quantities of baking-powder in two tumblers, and pouring a little cold water over one, and hot water over the other. The second glass will be filled immediately with the gas. This illustration goes to show that, to get the full quantity of the gas entangled in the dough or batter, all the materials should be cold during the mixing, and that the temperature to which the article is subjected while cooking should be moderate if a fine-grained, even-celled muffin or cake is desired; and if, on the other hand, one wishes an article filled with large cells the temperature should be higher.

When using soda and sour milk, lemon-juice, vinegar, and like acids, everything should be in readiness, and as much as possible of the mixing and beating should be done before the acid and alkali are combined. The work should progress very rapidly after this, or a great deal of the gas will escape into the air.

The cook should not depend wholly upon chemicals for making her dough and batter light. Where there is plenty of air entangled, only a small amount of carbonic acid will be required. The too generous use of baking-powder produces a dry, tasteless bread, muffin, or cake.

In beating eggs or a batter for the purpose of making them light, the movement should be rapid and the swing of

the arm out and upward; this motion lifts the mixture, and as it falls back it sweeps the air in with it. The value of eggs in making a substance light is not that of themselves they have this power, but that the albumin in the egg is a tenacious substance, capable of stretching and entangling a great volume of air. The albumin hardens at a low temperature, thus insuring the stability of the walls of the cells, a most important thing in delicate batters, like muffins and cake.

How and why eggs and batters are beaten.

The temperature at which doughs and batters are baked has much to do with the texture of the finished article. If the heat is too great at first, the bubbles of air and gas expand so rapidly that they do not remain in their individual cells, but burst their walls, which fall together, giving a muffin or cake filled with a mixture of great holes and of solid particles of dough, a coarse, tough article which no one likes. The same batter, if it had been cooked in a moderate oven, would have been evenly filled with fine cells; the texture would have been delicate and tender. If a batter is very thin, as, for example, sponge-cake or angel-cake, the heat must be very moderate. If the oven is too hot, the cake rises rapidly and then falls; that is, the walls of the cells expand too rapidly to hold the structure, and a collapse is the result, as is the case in making soap-bubbles when one blows too hard—the bubble bursts.

Effects of varied temperature on texture of doughs and batters.

A good general rule for baking batters and doughs is to have a very moderate oven for the thinnest batters, increasing the heat as the batters thicken, until we come to bread, which requires a rather hot oven. The heat must be as great, if not a little greater, at the bottom as at the top of the oven.

General rule for baking batters and doughs.

An important thing to remember, in baking all kinds of breads and batters, is that at first the dough or batter liquefies, and that at this stage a movement or a jar is almost

fatal. The article cooking should not be disturbed until the walls of the cells are well set.

We often use eggs as a thickening where we do not care to have them light. Many cooks have an idea that if they are not to be made light they need not be beaten a great deal. A well-beaten egg will have twice the thickening power of one only slightly beaten. When the egg is required for thickening it must be beaten in such a manner that it will not entangle air. Let the stroke be horizontal and inward, as if you were cutting the egg. A spoonful of liquid aids in preventing it from becoming light. Eggs for custards, puddings that are required smooth and creamy rather than light, and for thickening most soups and sauces, should be beaten in this manner.

When eggs are used to thicken and not lighten an article.

All puddings that are required smooth and creamy, such as custard, bread, rice, tapioca, should bake or steam slowly. Rapid cooking produces a tough curd-and-whey article.

FLAVORS AND ODORS

In the preparation of food, while it is important that we preserve, as much as possible, all the nutrition in the substance, it is quite as essential that we cook the food in the most digestible manner, even if this means a slight loss in nutrition.

We have seen how temperature affects albuminous and carbon compounds, and we have also seen the importance of the proper manipulation of the food materials, followed by the proper application of heat. There is another point which has not received from investigators the attention which it deserves; this is, What are the effects of retaining in the food all the odors and flavors that are developed and liberated in the cooking? There is not space here to go into this subject in detail; but a few facts, which have been proved by

years of careful observation and experiments, will help to a better understanding of this important subject.

All food materials contain flavoring substances, more or less strong, that are fully developed by heat. In the starchy foods the flavors and odors are mild, while in green vegetables, as a rule, both flavors and odors are pronounced. This is particularly true of vegetables that contain a good deal of sulphur or a pungent essential oil, as, for example, cabbage, cauliflower, onions, turnips, carrots, etc.

Odors and flavors developed by heat.

With the exception of starchy foods, all vegetable and animal substances that are cooked in *closed* vessels are difficult of digestion. The same foods thoroughly ventilated while cooking will have a delicate flavor and be easy of digestion—provided, of course, that all the other conditions for proper cooking are observed. Take, for example, cabbage, turnips, string-beans, or cauliflower. Cook them in plenty of boiling water for half an hour, having the water boiling all the while, and the cover partially off the saucepan, and it will be found that these vegetables will have a delicate flavor, and will not disagree with those who partake of them. On the other hand, cook them for the same length of time with the saucepan covered, and the flavor will be strong, and in most cases they will cause flatulence. By boiling with the cover off the stew-pan, a part of the gases which produce the strong flavor and odor are carried off in the steam, thus making the vegetable much more delicate and digestible. This will be found true in the cooking of all vegetables, meats, and fish. No matter what the process of cooking is, let there be thorough ventilation.

Effects of cooking in closed or in ventilated vessels.

Another point to remember in regard to heat, if you would have a fine-flavored vegetable, soup, meat, cup of coffee or tea, is that after the article has been raised to a certain temperature, it

Loss of flavor by lowered temperature.

must be kept near that throughout the cooking process. For example, a vegetable that is not kept up to the boiling-point all the time will be water-soaked and of poor flavor. A soup that is not kept at the simmering-point all the time will lack flavor. The cup of tea or coffee that goes below 200° will lose its fine flavor, and reheating will not restore it.

ECONOMY IN FOOD

True economy. Economy does not mean going without things that are necessary to health and happiness, but a wise selection and preparation of materials. It means that everything is put to its proper use, and there is no waste. The great difficulty in the ordinary family is that we have too many kinds of food for one meal, and that there is neither the time nor the skill to prepare so many things in the best manner. Fewer things simply and perfectly cooked and served would mean greater economy, better health, and greater refinement in the table.

Proper combination of food principles. The housekeeper should study to get the right combinations for health, growth, and repair. No one food substance, except milk, contains all the elements necessary to growth and repair, heat and force. Milk as a full diet is suitable only for young children and the very sick. In combination with starchy foods, or as a beverage alone, or in combination with other things, as chocolate, cocoa, etc., it is a most valuable food adjunct.

Eggs in almost any form are a valuable and economical food. Milk and eggs, however, have a tendency to produce a bilious condition, and can be eaten only sparingly by some people.

The vegetable foods that may, in a measure, replace meats should be found often on the tables of the people who must study economy. The housekeeper should never lose sight of the fact that there are certain kinds of food—the albu-

minous compounds—which are absolutely necessary for the growth and repair of the body, and that there must be a certain amount of these compounds in the food provided for each meal. There are few food substances that do not contain a little of each of the food principles, so that, without any thought or planning on our part, we get a certain amount of each in our daily food. The following tables may be helpful to the housekeeper in arranging the menus for the day:

GROWTH AND REPAIR	HEAT AND FORCE
Meat.	Starchy foods: Potatoes.
Fish.	Starchy foods: Rice.
Eggs.	Starchy foods: Corn.
Milk.	Starchy foods: Cereals.
Beans, with fat of some kind.	Starchy foods: Tapioca.
Pease, with fat of some kind.	Starchy foods: Sago.
Lentils, with fat of some kind.	Fats.
Cheese	Sugar.
Nuts.	

VEGETABLES WITH LITTLE OR NO STARCH

Cabbage.	Spinach, and, indeed, all the green vegetables.
Turnips.	Egg-plant.
Parsnips.	Artichokes.
Beets.	Tomatoes.
Celery.	Squash.
Green beans.	Cucumbers.
Asparagus.	

Fruits (fresh and cooked).

If at every meal something is taken from each of the four tables, the balance will be maintained. Of course there are conditions of health and eccentricities of digestion that must

be taken into account in many families. No one has a right to insist upon any one's eating any kind of food that is injurious to him, or that is painfully distasteful. On the other hand, people should try to like all the ordinary plain foods, both for their own comfort and good, and for the comfort of those who provide for the table.

Fads and common sense.

In these days, when there are so many fads as to when, what, and how one shall eat, the housekeeper must exercise her common sense, and not attempt risky experiments on herself and her family. It may be well for some people to omit the morning meal, and for others to give up certain kinds of food, but for the majority of people three meals a day and a mixed diet are a necessity. The important thing is not to narrow the diet down to a few things, but to know how to prepare all the food substances in a healthful, digestible, and appetizing manner, that the table may be provided with a generous variety.

Nothing need be wasted.

Purchase only what you need, prepare it carefully, utilize even the smallest particles of what is left over. You will find it possible to combine many little things which are ordinarily thrown away, so as to make a delicious dish. Mix, for example, a few spoonfuls of different kinds of vegetables, a little gravy or a small bone from steak or chops, a small piece of bread, water, salt, and pepper; simmer for an hour, rub through a sieve, return to fire; add a teaspoonful of butter, boil up, and you have a delicious soup. If the greater part of the vegetables were beans or pease, a little milk added to the strained mixture will give you a cream soup. Or, you have a little stuffing or gravy left from a roast; add this to a can of tomatoes, season with salt and pepper, cook half an hour, strain, and serve with toasted bread. This gives you a savory soup for a luncheon.

A few spoonfuls of rice, hominy, macaroni, or potato, mixed with a little chopped meat or fish, and a few spoon-

fuls of gravy to moisten the mixture, may be put in a little dish, covered with crumbs, and baked in the oven. Stuffing left from roast poultry may be sliced thin and browned in the oven, and served on slices of toast. Indeed, there need not be the slightest waste where brains and willing hands preside in the kitchen.

CHAPTER XII

WOODS AND POLISHED FLOORS

Polished floors. Hard-wood floors. Waxed floors. To clean and wax at the same time. Summary. Stained floors waxed. General directions for oiling floors. Summary. Cleaning with petroleum. Appliances used in polishing floors. Piazza floors.

Every one should have some knowledge of a material which enters as largely as wood does into the construction of houses and furniture.

A brief description of a log of wood.

A log of wood may be thus briefly described: the bark, immature or sap-wood, mature or heart-wood, pith. The bark is nearly always removed before the wood is employed in any but the rudest kind of structure, so we need not consider it. The sap-wood is the new soft wood lying between the bark and the heart-wood; it contains a great deal of soluble organic matter, which ferments readily, and causes the lumber to decay, unless it is soaked or dried out soon after the tree has been hewn. In the best lumber it is often removed.

The heart-wood is that part of the tree which lies between the sap-wood and the pith. This part of the log is generally much closer grained, harder, and darker than the sap-wood. It contains only a small amount of soluble organic matter, and is therefore less liable to decay than the sap-wood. In many of the soft woods there is no perceptible

difference in the color of the heart- and sap-wood; this is the case with poplars, soft pine, spruce, etc.

The combination of air and water destructive to wood.

Air and moisture combined are destructive to wood. When wood is kept dry and exposed to the air, it is not liable to rapid decay. Wood sunk deep in water or earth is less liable to decay than when exposed to the air and frequent wettings. Any application that will exclude the air will tend to preserve wood. Paint, oil, and varnish are the most common preservatives. All woods that have an outside exposure should be painted or oiled, or treated with one of the many preservatives on the market.

How the ends of posts sunk in the ground may be protected.

When posts are sunk in the ground, the ends that are to be buried should be treated in some manner, that they may not decay readily. If one cannot afford the expensive preparations, the ends may be burned long enough to cover them with a thin layer of charcoal, or they may be soaked in strong hot brine, and some coarse salt be put in the earth that is used to fill in around them; or they could receive two coats of paint, which will protect them from moisture. Locust, cedar, and chestnut, in the order in which they are named, are the best woods for putting in the ground.

Resinous woods resist decay.

Wood that has a resinous substance distributed throughout its structure resists decay when exposed to air and moisture. The resins are insoluble in water, and harden on exposure to air, thus making the wood impervious to moisture. It is for this reason that yellow pine (the long-leafed pine commonly called Georgia pine) is so desirable for piazzas, kitchen and laundry floors, and all other situations where wood is exposed to air and moisture.

The gums are soluble in water, and therefore do not afford the protection to wood that resinous matter does. The

closer grained and the smoother the wood is planed, the less liable it is to absorb moisture; hence the more durable.

Wood that has had the sap dissolved and soaked out of it, and is then dried with care in well-ventilated sheds, is more durable than the wood that has had the sap dried in it. In drying, wood shrinks in its breadth and depth, and little, if any, in the length. If these woods absorb moisture they expand in the direction in which they contracted. All woods warp more or less when exposed to atmospheric changes. In selecting woods for floors, doors, windows, etc., care should be taken to choose those having the least tendency to warp. Some of the woods having this tendency are all the poplars and the short-leaved yellow pine.

Wood shrinks in breadth and depth and little in length.

The mode of sawing the boards has much to do with the wearing quality of the wood in floors. Among lumber-dealers, boards are designated from the manner of cutting, as "quartered," "rift or comb grain," and "slash" or "bastard." The quartered and the comb grain give a board that wears smoothly and does not sliver, a most desirable quality in a floor. The slash or bastard, in some woods, peels off in fine slivers, making an unsightly and poor-wearing floor. This same wood is beautiful and quite durable in interior finishes that are well protected and not subject to friction, as, for example, in panels of doors. In some woods, such as maples and other hard woods, the slash is so fine and close that it never grows rough, and it can be used in furniture, interior finish, and floors quite as well as quartered or comb-grained wood. On the other hand, in all the pines, spruce, poplars, some of the ash, etc., the annual layers separate with more or less ease. An explanation of the manner of growth and cutting will help to an understanding of why we have so many unsatisfactory floors, and the remedy for them.

The mode of sawing is largely responsible for the wearing quality.

A brief explanation of the manner of growth and cutting of wood.

The tree grows from the outside, each year making a layer that is higher than that of the preceding year. Fig. 48 shows roughly how these layers are arranged. The space between *a*, *b*, and *c*, *d*, would give rift or comb-grain boards; that between *b* and *c*, slash or bastard. Fig. 49 shows the rift and slash in a pine board. *a*, *a* is rift; *b*, slash. Fig. 50 shows the manner of cutting a log. The half *a* shows the ordinary way of cutting which gives one broad board. The center of the board, *d*, will contain the short annual layers—slash—and the outside, *c*, *c*, the long annual layers—rift. The board is often recut, giving two pieces of rift and one of slash. The half of the log *b* shows one of the methods of quartering woods. This is done a great deal with the fine oaks used for furniture and interior finish. By this method the wood is all cut across the grain.

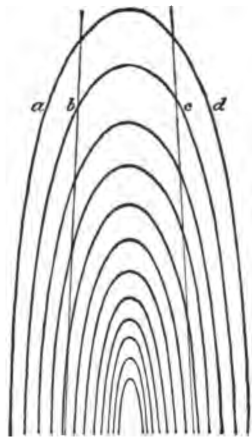

Fig. 48.

In laying floors that are not to be covered, the slash of the soft woods should never be used. Shelves and tables in kitchens and pantries should not be made of slash wood.

An expert's advice in regard to best wood and manner of preparing for floors.

Since bare floors are becoming almost universal, the following advice from an expert as to the best wood, and the manner of preparing and laying them, will aid those who want good floors that shall increase in beauty with years and with proper care. Nothing is said of inlaid floors, as this kind of work should be done by men skilled in that line.

"The hard woods used as flooring are oak, ash, maple, walnut, mahogany, and cherry. The so-called soft woods

are white pine, yellow pine, hard pine, spruce, the poplars, and basswood.

"The hard woods do not shrink as much as the soft woods. Yellow pine does not absorb moisture as readily as some

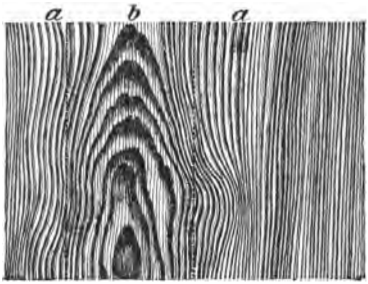

Fig. 49.

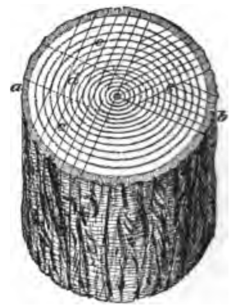

Fig. 50.

woods, because of the amount of resinous substance in it; for this reason it is excellent for kitchen and laundry, or any floors exposed to moisture.

"Maple is one of the most satisfactory woods for a floor. It may be used in any part of the house, from parlor to kitchen. It grows smoother and finer with wear. The first cost is greater than yellow pine, but it pays in the end.

"The boards for floors should be planed on both sides. The planing on the under side is to prevent the wood from absorbing moisture.

"To insure the floor against becoming uneven because of the boards expanding if there is moisture, each board should be about one sixteenth of an inch narrower on the under side than on the top; this allows of expansion and contraction.

"Flooring should be made of 1¼-inch plank, tongued and grooved. This flooring will cost perhaps one third more than that made from the 1⅛-inch plank, but it will be cheaper in the end, because the work will cost the same with either

kind, while the thicker plank will wear more than a third longer than the thinner."

POLISHED FLOORS

Slowly but surely the polished floor is making its way into homes in all parts of the country. "Oh," some say, "it is only a fad which will have its day, and pass away like other fads." On the contrary, it is not a passing fad, but a sensible hygienic fashion which has come to stay, and which commends itself to all thinking people. The advantages of such a floor are its cleanliness and healthfulness, the ease with which a room with such a floor can be kept clean, and, after the first cost, the economy of it.

One has only to observe the difference in sweeping a carpeted floor and one that is uncarpeted to realize the greater cleanliness and healthfulness of the polished floor.

The cleaning of a polished floor easy and sanitary.

When sweeping is being done in the carpeted room, the dust rises in clouds, more or less heavy, according to the condition of the carpet and the method of using the broom. Naturally the dust settles on the walls, doors, and windows, and is inhaled by the sweeper. To remove it requires time and care, and a second breathing of dust-laden air for the sweeper.

On the other hand, the hair brush or dust-mop may be passed gently over the polished floor, taking up all the dust without raising or scattering it. The dust on walls, woodwork, or furniture is but slightly increased by this sweeping, and the person cleaning is not compelled to breathe disease-germs with the dust. Certainly the floors of rooms continually in use, such as the dining-room, living-room, bedrooms, and bath-rooms, should be polished, or covered with a fine, closely woven matting.

By polished floors is meant any floor finished smoothly,

and stained, oiled, varnished, waxed, or painted. Any floor of this kind may be kept clean without the aid of much water; and this is a great consideration when we realize that moisture is one of the conditions favoring the growth of bacteria. Thus if the boards forming the floor are kept dry there will be no decay, and but slight chance for the growth of germs.

Sanitary value of polished floors.

Although hard wood is the most desirable material in every way for a floor, one can manage with a pine floor that is fairly well finished. The tendency of pine boards to sliver, and their softness, make it impossible to have a beautiful floor, but one can get fair results and a reasonable amount of wear out of it if it is treated carefully, and if rugs are laid where the greatest wear comes.

Crude petroleum can be used to cleanse floors that have been painted, varnished, or oiled. This oil not only cleanses, but at the same time it gives a finish. The refined oil may also be used, but does not clean so quickly or thoroughly as the crude petroleum.

Use of crude petroleum on floors.

Before deciding on the kind of finish to be put on the floor, the question as to whether it is to be light or dark must be settled. If the floor is to be kept the color of the wood, it must be waxed or varnished with a clear varnish. Oil darkens a wood. The more oil used, the darker the wood is made. Wood that is oiled darkens with age. The lightest oil used for cleaning and oiling woods is petroleum. When linseed-oil, sweet-oil, or paraffin-oil is employed for cleaning or polishing woods, it is diluted with turpentine to make it lighter. Any surface except a waxed surface may be polished with oil.

Color of the floor.

HARD-WOOD FLOORS

The daily care of the polished floor is perhaps greater than that of the carpet. But this daily care is so simple,

and the outlay of time and strength so small, that it is very little compared with the amount of strength and time one must give a carpeted room in the course of a year.

Many persons object to the wood floor on the score of danger and cold. When one remembers that the hard-wood floor is, as a rule, an extra layer of boards, perfectly joined, it will be seen that it is a better protection against wind and dust than is the carpet. Besides, one always has rugs on which the feet rest when one is sitting. As to danger, these floors need not be so highly polished that there is danger from them. An oiled floor is less slippery than one that is waxed. A floor polished with encaustic can be made less slippery than one polished with the pure wax. The amount and hardness of the rubbing makes the floor more or less beautiful, and also more or less slippery.

Rugs for hard-wood floors.

Small, smooth rugs should not be put at doors or on hall floors, where one is apt to walk quickly and without thinking. There is no danger when the rug is large and heavy. The coarse Japanese rug is excellent, because it does not slip easily on the polished surface. Otherwise, if one disposes of the rugs by couches, tables, etc., there is no danger. I should advise a strip of carpet on polished stairs. The sides can be kept as brilliantly polished as one may wish. In caring for a hard-wood floor, it must be remembered that water is one of the worst things that can be used. If at any time there should seem to be a necessity for cleaning with water, it must be only by means of a soft cloth wrung out of warm water. It must also be rubbed with another dry one. Then it should be oiled or polished at once. Any liquid spilled upon a waxed floor and allowed to dry of itself will produce a stain which can only be removed by hard rubbing and the encaustic. Even drops of clean cold water will spot a waxed floor unless they are wiped at once.

Effect of water on polished floors.

The daily care of the hard-wood floor is very simple. If the room is much used, it must be swept first with a soft hair brush, then wiped with a long-handled dust-mop which comes for this purpose and is also known as a yacht-mop. When a room is not used much the dust-mop is all that is required. If there are spots on the floor, they should be rubbed with a piece of flannel or carpet. If this does not remove them, they may be cleaned with a little turpentine on a piece of cloth; this takes off the polish, and it will be necessary to rub the spot with a cloth moistened with encaustic or with oil, according to the finish, and then polish it.

Daily care of floor.

Once a week all the spots should be wiped clean, and a cloth moistened with encaustic, or oil and turpentine, should be rubbed on any parts of the floor where the polish has worn off; then the floor should be rubbed with a weighted brush. This weekly treatment is only for rooms very much used.

Weekly care of hard-wood floor.

A floor that is thoroughly cleaned and polished twice a year can be kept in beautiful condition by this weekly care.

These general directions are for the daily and weekly care of well-finished waxed or oiled floors. Exact instruction is necessary for each method of treatment. I have seen so many floors spoiled, the most beautiful as well as the commonest, by improper treatment, that I shall go into the minutest details of waxing, oiling, and polishing floors. These directions will be followed by a summary of the methods, which will give the different steps of the work concisely and clearly. Having read the details carefully, the worker will find the summary a clear and simple guide.

Necessity of proper treatment of floors.

WAXED FLOORS

The floor to be waxed should be perfectly smooth and clean. The boards of a close-grained wood made perfectly

smooth can be waxed without any other preparation. An open-grained wood will require filling. If the wood is desired one or many shades darker than the original tone, some color can be put in with the filler. The filling and staining, if any, are generally done by the men who finish the floors. (See "Finishing, Filling, and Staining of Floors.")

Preparing the floor for waxing.

The wax for polishing can be bought prepared for use, or it can be prepared at home. (See encaustics No. 1 and No. 2.) The prepared polishes come in liquid and in solid form. The liquid is more easily put on, and requires little rubbing to give the boards a high polish; but the surface is more slippery than when the more solid forms are used.

Put the wax where it will be getting warm and soft. Have the room thoroughly swept and dusted, all the furniture dusted, the lighter pieces removed from the room, and the windows washed. Wipe all the dust from the floor with a damp cloth. Go over the floor carefully, and clean any soiled places with turpentine and a flannel cloth.

Should black stains, from water or other causes, come on the boards, pour a strong solution of oxalic acid on the spot, letting it remain until the stain disappears. The acid not only removes the stain, but also the color from the wood, and this must be restored before polishing. (See "Restoring Color to Wood.")

Removing stains with oxalic acid.

When all the floor has been cleaned in this way, moisten a flannel cloth with the soft wax, being careful not to have any large or hard bits of wax on it. Rub the floor all over with this cloth, renewing the wax whenever necessary. When all is done, let the floor remain in this condition an hour or more, if there is time; then polish it with a weighted brush, rubbing with the brush until a soft luster comes. When the whole floor has been polished in this manner, cover the brush with a large woolen cloth or a piece of clean woolen carpet, fastening the cover

Method of applying wax to floor.

on the brush with safety-pins. Rub the floor with this, and the surface will take on a higher polish.

TO CLEAN AND WAX AT THE SAME TIME

When the floor is very much soiled, it can be cleaned and polished at the same time by using encaustic No. 2 and turpentine.

Put the encaustic in a bowl, then set in a pan of boiling water. Have the floor swept and dusted. Have two woolen cloths and several pieces of old cotton; waste cotton is very good if it can be procured with ease, but any kind of soft uncolored cotton will answer.

Method of applying the encaustic.

When the encaustic is hot, add about an equal volume of turpentine to it. Keep the bowl in hot water, but away from the fire, as there is danger from the turpentine. Dip one of the flannel cloths in the hot mixture, and begin at one side of the room, rubbing as large a space as you can comfortably until it is clean. Then with the cotton cloth wipe off the soiled cleaning-mixture; next polish with the second piece of flannel.

Polishing.

If the floor is not very dirty, and requires polishing only, dip a brush or cloth in the hot mixture and go over the floor quickly but thoroughly. Let this stand until dry, which will take two or three hours; then polish with the weighted brush as directed in the first rule for polishing a waxed floor.

The encaustic can be used on any waxed floor or on a varnished floor.

SUMMARY

1. Put encaustic No. 2 in a bowl, which place on the fire in a pan of hot water.

2. Sweep and wipe floor.

3. Add equal volume of turpentine to hot encaustic, and dip woolen cloth into mixture; clean with this. Wipe with cotton cloth, and polish with woolen cloth. Or, go over floor quickly with cloth dipped in hot mixture.

Let the floor stand for several hours, and then polish with weighted brush. This treatment can be given to regularly waxed floors or to varnished floors.

STAINED FLOORS WAXED

To wax stained floors.

Stained floors can be waxed with any of the prepared waxes, or with encaustic No. 1. Never use No. 2, as it would take the color out of the boards. Proceed as directed in first rule for waxing.

GENERAL DIRECTIONS FOR OILING FLOORS

The oiled floor is often unsatisfactory because the work has been done improperly. Sometimes the oil used was too heavy, and it may not have been rubbed into the wood thoroughly. Then, again, the floor and room may not have been perfectly clean, so that the floating dust lodged in the oiled surface and soon became black and unsightly.

Application of boiled linseed-oil.

If the boards are new, and one wants to saturate them with boiled linseed-oil, the oil should be made rather hot. Have the room and floor perfectly clean. Dip a broad paint-brush in the oil and go over the floor, working the brush back and forth on the boards as if painting. Let this stand for an hour or more; then cover a weighted brush with a woolen cloth, and go over all the floor, rubbing with the grain of the wood. The polishing must be continued until the floor looks smooth and not oily.

Another way is to mix two thirds boiled linseed-oil with

one third turpentine. Wet a cloth in this mixture, and rub it into the boards, following this with a brisk rubbing with a woolen cloth in the hands or on a weighted brush.

Secret of success in oiling wood.

The secret of success in oiling wood of any description is to use a good quality of oil, with enough turpentine or alcohol added to make it rather light—from one fourth to one half as much turpentine or alcohol as oil. Have the surface to be oiled perfectly clean and free from floating dust. Rub the oil mixture well in, and let it stand an hour or more to dry. Finally, rub the surface briskly with a woolen cloth until it has taken a polish and there is no moist oil on the surface.

Oiling painted floors, linoleum, etc.

A floor with any kind of finish except wax can be oiled in this manner. Painted floors, linoleum, and oil-cloth are much improved by this treatment. They should first be thoroughly washed, then rubbed with a cloth made damp with oil and turpentine in equal proportions, and polished with the woolen cloth. Such floors are not soiled easily, and they retain their luster and softness for years if they are thus treated.

SUMMARY

1. Have floor and room free from dust.
2. Dampen a woolen cloth with boiled linseed-oil and turpentine, and rub into boards, rubbing with the grain.
3. Polish the oiled surface with a dry woolen cloth.
4. If boards are new, and it is desired that they absorb much oil, have oil heated and put on thickly with woolen cloth or brush. Let the floor stand a few hours to have the oil strike in; then polish.

CLEANING WITH PETROLEUM

Have the room and floor free from dust. Wet a woolen cloth with petroleum,—either the crude or the refined article

may be used,—and rub the boards briskly, rubbing with the grain. When all is finished, let it stand an hour or two to dry, then polish with a woolen cloth. If the polishing is not done, dust will adhere to the floor, and if the boards are varnished or painted they will have a cloudy appearance in a day or two. The odor of petroleum is very disagreeable, but if there be a free sweep of air through the room it passes off in a short time.

The importance of polishing.

Petroleum does not contain enough fat to give a fine, soft finish to boards; therefore the floor should be treated with boiled linseed-oil and turpentine about once in two or three months when a room is not subjected to hard usage. For a kitchen floor once a month is a fair average.

APPLIANCES USED IN POLISHING FLOORS

Upon the right selection and proper treatment of the appliances used in the care of floors will depend the success and ease with which the work is done. There will be required soft cloths (woolen, when possible), clean pieces of carpet, one long-handled and one short-handled hair brush, one dust-mop (sometimes known as a yacht-mop), one dust-pan, one weighted brush, boiled linseed-oil, turpentine, wax, and a metallic or stone receptacle for cloths used in oiling and waxing.

The weighted brush, oil, turpentine, and wax are the only additional appliances necessary for the care of polished floors; all the other implements are such as are also required for ordinary floors.

The weighted brush may be bought at any first-class kitchen-furnishing store, and it costs about five dollars. It is indispensable in a house where floors are waxed, and is most useful in polishing any floor. It is a broad, flat brush made from the best Russian bristles. On this brush is fastened a loaded top.

The weighted brush, and how used.

A long handle, which can be bent to a certain angle, is fastened into this. When this brush is placed on the waxed surface it is pushed back and forth until the boards take a high polish. At first it moves with difficulty, but after it has passed back and forth over the surface two or three times it slides over easily. On no consideration must this brush become oily. When any oiled surface is to be polished, the brush is covered with a thick woolen cloth or piece of carpet, which can be fastened on with safety-pins. It is important that this brush be kept perfectly clean, and for this reason it must always be kept covered when not in use.

Care of weighted brush.

Make a cotton bag with running-strings; slip the brush in this, and tie. This brush is so heavy that it should have a place to stand where it will not often be necessary to carry it over the stairs. Of course floors can be polished by getting down on one's hands and knees and polishing with brush or cloth, but this is very hard, slow work. The French have brushes that can be strapped on the feet, and most of the polishing is done in this way. This work is usually done by men.

To clean weighted brush.

About once in two or three months wash the brush in the following manner: Half fill a pail with tepid water, and to this add three tablespoonfuls of household ammonia. Soak the brush in this for about half an hour. Sop it up and down in the water, then rinse thoroughly in clear, cold water. Wipe and turn it up to dry in a current of air. It takes some time to dry, so the washing should not be attempted just before polishing the floor. The drying must never be hurried by placing the brush near heat, as that would spoil it. With this care a weighted brush ought to be serviceable from ten to twenty years. When the bristles are worn out a new brush can be put on the loaded top.

The dust-mop, which is a thick mop of soft cotton thread

fastened to a long handle, costs about seventy-five cents. One can with this wipe up the dust from a large floor in five or ten minutes. It should be thoroughly shaken every time it is used, to remove the dust. Once a fortnight soak it in ammonia water as directed for the weighted brush, then wash and rinse in warm water, and hang out to dry.

The dust-mop.

The woolen cloths used in waxing, oiling, and polishing are too valuable to be thrown away, and until they are really dirty they can be used again and again, the oil and the wax with which they are saturated making them more valuable. When, however, they do become dirty, they must be cleansed.

Dissolve two tablespoonfuls of washing-soda in four quarts of boiling water, and pour into a pail. Put all the woolen cleaning-cloths in this, and let them soak for an hour, stirring them several times with a stick. At the end of this time add a gallon or more boiling water to the contents of the pail, which place in the sink. With the stick work the cloths about in this water for a few minutes, then pour off the water, and add hot soapsuds, and work them, as before, with the stick. Rinse them in fresh hot water. All the dirt and soda will have been washed out in this manner. Put two quarts of warm water and a tablespoonful of linseed-oil in a pail. Rinse the cloths in this, and put them out to dry. The soda will have removed all the dirt and wax, and also some of the natural oil of the wool. The oil is put in the last water to replace the oil washed from the wool and thus keep it soft.

Cleaning of cloths.

The pieces of carpet used in polishing must receive the same treatment. All materials used in oiling and polishing must be kept in covered non-combustible receptacles, because these materials are liable to spontaneous combustion. Stone jars with covers, or tin pails or boxes, make safe receptacles for cloths saturated with oil or turpentine.

Receptacles for polishing and cleaning cloths.

Casters or rubber pads on furniture ruin a fine floor. Have that part of every piece of furniture which rests on the floor covered with thick felt. This is glued on. With this felt finish, heavy pieces of furniture can be moved with great ease.

Felt pads for furniture.

The thick felt which may be purchased at the paint-supply shops is the best for this purpose because of its thickness, but it is very expensive. Old felt hats may be used instead.

To fasten felt on furniture.

Cut the felt to fit exactly the bottom of the foot of the piece of furniture. Spread on this, and on the surface to be covered, a thin layer of glue, and fasten in place. In the case of heavy pieces there will be pressure enough to hold the felt firmly in place, but chairs and light tables should have additional weight placed upon them.

PIAZZA FLOORS

Taken all in all, oiling is the best treatment for piazza floors. Use clear boiled linseed-oil, very hot. Have the piazza perfectly clean and dry. Apply the hot oil with a brush. Let this dry for a day, and then apply a second coat of hot oil. The next day give a third coating of the hot oil. When this dries, rub the piazza smooth with clean pieces of old carpet.

The more oil the boards absorb, the better they will look and the less danger there is of decay. After this first thorough treatment with oil, all that will be required in the future is an oiling whenever the boards begin to look dry and rusty. After the thorough oiling and rubbing such floors can be varnished. It is important that a good "outside" varnish should be used. The person cleaning and polishing floors should wear soft, clean slippers.

Oil a preservative.

CHAPTER XIII

TREATMENT OF WOOD FINISHES

To restore color and finish to wood. Summary. How to make pads for wood finishing. To clean and restore the polish on woods. Summary. To clean the woodwork of furniture.

The woodwork of the finish and furniture of the house is often in need of slight repairs for which it is not worth while to call in a regular cleaner and restorer, even if it is always possible to find such a person. If one knows what to do in such cases, all these finishes may be kept in good condition with a slight outlay of time and strength. It is, in fact, analogous to the care of the household linen, where the stitch in time saves nine.

TO RESTORE COLOR AND FINISH TO WOOD

Careful treatment can sometimes repair damages.

A piece of furniture, a door, or a mantel has been scratched, stained, or otherwise marred; it is a constant annoyance, and what a relief it is to be able one's self to give it the little careful treatment that is necessary! If the following directions are put in practice the work may be successfully done by any one.

The marred place must be rubbed smooth with the finest grades of sandpaper. Take a small piece of paper not more

than two inches square, and rub the spot gently until the surface is as smooth as glazed paper. There should be no appearance of lines or scratches on the wood. This condition can be reached only by light, gentle rubbing, and it may take several pieces of sandpaper to do the work. If the marred place is large or deep use a medium grade of sandpaper at first, and finish with the finest.

Rubbing with sandpaper.

Wipe all dust from the spot, then oil it. Make several small pads, not larger than a walnut. Wet a pad with paraffin-oil, then with shellac. Touch the surface of the damp pad lightly with the color you are about to use, and rub gently on the spot. The motion must be light and even, a gliding movement. If pressure is used at first, and if the pad is raised and lowered, the surface will be cloudy and uneven. This is true of any polishing when shellac is used. Put a little more oil, shellac, and color on the pad, and go over the surface once more. Do this again and again, until the desired color has been obtained. When the pad becomes a little hard, take a fresh one. It may require several pads to do the work. If it should happen that you get too much color in the spot, it may be made light by wetting a clean pad with alcohol and going over the dark place lightly and gently. If there are two or three shades in the color that you wish to restore, the several pigments should be put on the pad at the same time, just a touch of each, naturally using more of the predominating color; as, for example, in mahogany, where Bismarck brown, yellow ocher, and aniline black are used, Bismarck brown is the principal color, and there is only the suggestion of aniline black. The dry powder is used in the method given.

Applying paraffin-oil, shellac, and color.

To give variety of tone.

The colors should be taken up on the point of a penknife or of a stick. It may be thought by the beginner that it is

a waste of time to go over the surface so often, using such homeopathic doses, but it is the only way to bring up the color to match the old shade. The movement of the hand and arm must be free and sweeping, the pad gliding over onto the uninjured surface.

Need of many applications.

Before beginning the work, examine the finish carefully, and decide what colors enter into its composition. You will find that woods of the same kind vary greatly as to the shades of color in the finish. For example, black walnut in some pieces of furniture has yellow tones predominating, while in other pieces red and black tones are more noticeable. A list of colors for the different woods is given below, but you must use your own eyes and judgment as to the amount of each required. After each fresh application of color, examine carefully to see if you are getting in the right shades. It is a good plan to practise a few times on old or new boards before attempting either woodwork or furniture; you will be surprised, after that, to find how easy and interesting the work becomes. Here is a list of colors for the woods in common use.

Importance of getting exact shade of color.

Mahogany and *cherry*—Bismarck brown, with a little yellow ocher and a suggestion of aniline black.

Black walnut—burnt umber, yellow ocher if yellow is required, Bismarck brown if red is required.

Oak—raw or burnt umber, until the color comes.

Light woods—raw umber.

Colors of woods in common use.

Burnt sienna may be substituted for Bismarck brown, or it may be used with it. When the cherry is a decided reddish shade, burnt sienna is best, and it may be that no other color will be required.

SUMMARY

1. Examine finish to decide on colors to be used.
2. Make small pads.

3. Have small bottles of shellac, turpentine, paraffin, or boiled linseed-oil.

4. Sandpaper the marred place, and then dust thoroughly.

5. Oil the sandpapered place.

6. Wet pad with oil, then with shellac, then put on a light coating of the color.

7. Rub the spot with pad, letting the motion be light, free, and gliding.

8. When pad begins to dry, wet with oil and shellac, and add a little color; continue this until required color is obtained.

9. Change pads for fresh ones whenever they begin to grow rough and hard.

10. Remember that the rubbing must be light and even, and that shellac will not admit of friction, the surface becoming rough and clouded when hard rubbing is used in the first application. As the surface begins to dry, the pressure may be increased slightly (this is at the end of each application of oil, shellac, and color).

Method of removing dents in wood.

Dents in wood may be removed in the following manner: Take several thicknesses of soft brown paper and soak in hot water. Lay this wet pad on the dent, put one or two thicknesses of wet cloth over this, and then lay a red-hot iron over all. As soon as cloth and paper are nearly dry, wet and apply again, as before. If the dent is deep it will take several applications of the wet materials and hot iron to raise it. A dent in wood is only the layers pressed more closely together than is natural; the heat and moisture cause the fibers to swell and fill the original space.

If the dent is small, a hot poker will answer for the work; on a large place a shovel may be used. When the dent is not deep, polishing with oil, shellac, and color, if needed, will answer all purposes. Follow the directions given for color and polish.

HOW TO MAKE PADS FOR WOOD FINISHING

Make smooth, hard little rolls of cotton batting about the size of a small walnut; cover these with bits of old linen, cotton, or cheese-cloth. Leave the ends long enough to get a firm hold. Fasten by winding a thread round the cloth where it is drawn over the ball of cotton.

The points to be especially careful of in making these pads are that the ball of cotton should be smooth and firm, and that the cloth must be drawn smoothly over it and tied securely.

TO CLEAN AND RESTORE THE POLISH ON WOODS

In the course of time finely polished woods become dull and cloudy; the dampness in the atmosphere also has this effect on polished surfaces. The brilliancy and luster may be restored by thorough rubbing with the proper appliances. The methods here given may be used on the finest finishes, be they oil or varnish; but the treatment is not intended for waxed surfaces.

Appliances necessary for restoring polish.

Rottenstone, pumice-stone, tripoli, all finely powdered, turpentine, paraffin-oil, alcohol, felt, soft cotton, and linen cloths will be required for the work. Willingness and strength to rub carefully and thoroughly are also essential.

Making the rubber.

Take a small block of wood about the size of a brick,—a brick, in fact, will do very well,—and cover it with several thicknesses of cotton batting; over this put several thicknesses of old cotton cloth, and finally lay on two or three thicknesses of old linen. The various layers may be sewed in place. This is the "rubber." Two pieces of felt, each about eight inches long and five wide, will be needed.

Mix together enough rottenstone and oil to make a paste the consistency of thin cream. Spread this on the surface to be polished, and rub with one of the pieces of felt, using at first a circular movement, then rubbing across, and finally with, the grain of the wood. The oil and rottenstone should be renewed whenever needed, and on no account should the rubbing be continued when the rottenstone gets so dry that there is the least friction, which would cause slight markings on the varnish. When the movement of the felt begins to be slightly impeded, put a little more oil on the surface to be polished. When the desired luster has been obtained, continue to rub gently until all the oil and rottenstone have been worked off. Then rub with the clean felt until the surface is dry and brilliant. The finish is now cleaned and polished; but it will not keep in this condition if there is not a final dressing with oil.

Method of restoring polish.

Wet a soft cloth with a mixture, half paraffin-oil and half turpentine. Rub the wood well with this, and let it stand about an hour; then sprinkle with the fine tripoli, and let it stand again an hour or more to absorb any oil there may be on the surface of the finish. Wipe off the tripoli, and polish with the linen rubber, rubbing with the grain of the wood.

Final dressing of oil.

When applying the oil and rottenstone with the felt, the pressure must not be too great, as there is danger of cutting through the varnish. The movement must be regular, and continued long enough to produce a good deal of heat. Only a portion of a large surface should be done at a time. Pumice-stone may be used on oiled surfaces, or on finishes that are not very fine or that are very dirty. On a flat surface like a table the oil may be poured on, and the powdered rottenstone be sprinkled over it. If it is not convenient to use paraffin-oil, linseed-oil can be substituted.

Manner of applying rottenstone, etc.

Instead of the oil and rottenstone or pumice-stone, the furniture-cleaner and -polisher may be used.

The felt for applying the oils may be bought at a painter's supply shop. As it is expensive, after it has been used it should be washed thoroughly in hot soap and water, and rinsed in a hot solution of sal-soda, then rinsed in plenty of clear water, and dried. Old felt hats may be used instead of the felt one gets at the paint-shops.

Treatment of felt.

There are other modes of polishing dulled surfaces, but I consider this the best, and will not, therefore, give the others.

SUMMARY

1. Mix oil and rottenstone to the consistency of thin cream.
2. Spread some of this mixture on the surface to be polished, and rub gently, regularly, and for a long time with a piece of felt, renewing mixture or oil when needed.
3. Finish polishing with clean piece of felt.
4. Oil, and let stand one hour.
5. Sprinkle with tripoli, and let stand an hour or more.
6. Wipe off tripoli, and polish with linen rubber.

TO CLEAN THE WOODWORK OF FURNITURE

Varnished woodwork, when it becomes very much soiled, may be washed with soap and water, if the varnish is unbroken. But if the varnish is worn off, or if there is a scratch deep enough to cut through the varnish, water should not be used until the surface has been soaked in oil for some time. When the wood is unprotected by varnish or oil, the water penetrates it, and makes a dark stain, which grows darker with time and spoils the appearance of the

When soap and water may be used on varnished woodwork.

wood. It is necessary, therefore, to examine the wood carefully before beginning to clean it. However, it is always safe to use the oil first, as it not only penetrates the wood, but it also softens the dirt.

Method of cleaning varnished woodwork.

1. Pour some paraffin-oil in a saucer; dip a soft cloth in this and go over the soiled woodwork, making it quite wet with the oil. Let this stand an hour or two.

2. Make a strong suds with soap and water. Wet a woolen cloth in this, and wash the wood, using a good deal of pressure in rubbing the surface. When the woodwork is clean, wipe it dry.

3. Put into a bottle one pint of paraffin-oil and half a pint of turpentine; shake well. Wet a soft cloth with this mixture, and go over the cleaned wood. Let it stand a little while to evaporate; then rub with a dry linen or cotton cloth, rubbing briskly. It gives the surface a finer polish if, after the rubbing with the linen cloth, a fresh linen cloth, wet with a mixture of one part oil and three parts alcohol, is rubbed lightly and quickly on the polished wood. Alcohol or vinegar may be substituted for the turpentine, if the odor is disagreeable.

When the woodwork does not require cleaning, but looks dull or faded, polish with the turpentine and oil.

When faded by exposure to heat of sun or hot air, may be rubbed with linseed-oil.

If a piece of furniture has stood near a window, register or other heating apparatus, the oil will be evaporated from that part that has been exposed to the heat of the sun or to hot air, and will become faded and full of fine lines. To remedy this, oil the surface with pure boiled linseed-oil, rubbing it in well. Several oilings may be required to bring back the finish and color. If parts of furniture thus exposed are watched, and oil is promptly applied as soon as it is needed, much trouble will be saved.

Treatment of carvings.

Carvings and the grooved parts of furniture must be oiled with a small brush kept for this purpose.

The above methods are for oiled or varnished furniture. If the finish is wax, the cleaning must be done with turpentine and the surface polished with wax. (See Encaustic No. 1.)

To clean woodwork of waxed furniture.

To clean the woodwork of waxed furniture, wet a woolen cloth with turpentine, and go over the soiled surface, rubbing briskly. When all is cleaned, spread the softened prepared wax on a woolen cloth, and rub this on the surface to be polished. Let it stand an hour, if possible; then rub with a brush; follow this by another rubbing with a woolen cloth. If this rubbing is followed by a brisk rubbing with cork, the luster will be much finer; but in any case the friction must be thorough enough to remove all traces of the wax and leave a brilliant polished surface. While a thorough polishing of a surface finished in oil is always desirable, a moderate amount of friction will answer; but when wax is used, it is absolutely necessary that there is thorough rubbing with some woolen substance. For this reason, unless one has a strong man to do the work, it is better to use the oil and turpentine, oil and alcohol, or oil and vinegar.

Cork for polishing.

The cork may be purchased at a paint-supply shop or at a chemical-supply shop. It comes in sheets or large disks. Before using it, make the surface smooth with fine sandpaper.

CHAPTER XIV

OILS: THEIR USE AND BEHAVIOR

Lubricating oils. Cleaning oils. Oils used as foods and medicines. Cotton-seed oil. Castor-oil. Cod-liver oil. Spontaneous combustion.

Oils are so continually in use in every department of the household that they are an important element in the domestic management. They enter into the composition of paints and varnishes, into the substances used in the finishing and cleaning of woods, metals, machinery, etc., and into the making of many of our foods and medicines. Ignorance of their source, action, and application often leads to their wrong use and renders them worthless.

Knowledge of their action and application essential.

As space is limited, it will only be possible to make the briefest mention of the oils most commonly used in and about the household.

Oils may be divided into three classes—*animal*, *vegetable*, and *mineral;* and these, from their characteristics, are again classified as *fixed* and *volatile.*

The term "fixed" may be defined as made fast, firm, stable, not wandering. If we spill a few drops of oil on a paper, and then expose the stain to the action of air and light for a few days, we can determine whether the oil is fixed or volatile. If it is a fixed oil the stain will be as apparent after this exposure as when it was

Definition of fixed and volatile oils.

first made; sometimes it will even be darker. If, on the other hand, all traces of the stain have disappeared, the oil is volatile; that is, it is unstable, and passes off by evaporation. We can make this test more quickly by placing the stain near a heated surface.

All mineral oils are volatile; hence we can use them for cleaning and other purposes where it is desirable that all traces and odor of the oil should disappear quickly.

Mineral oils.

The mineral oils are petroleum, which is found already formed in the earth in almost every quarter of the globe, and other oils obtained by the distillation of bituminous bodies, such as cannel-coal, coal-tar, etc. We are familiar with the products of these oils in the form of crude petroleum, kerosene, naphtha, gasolene, etc.

Fat and essential oils.

The vegetable oils fall naturally into two classes—the *fat oils* and the *essential oils*. Of these the fat oils are fixed, and the essential oils are volatile. The essential oils, of which there are many, are produced in nearly every part of the various plants except in the cotyledon of the seed, where the fixed oil is found. These oils are obtained from the plant by pressure, by distillation, by solvents, and by maceration. The most familiar example we have of obtaining oil by pressure is the process by which the oil is extracted from the rinds of fruit. The thin yellow rind of lemons, oranges, or limes is finely divided and then subjected to great pressure. Or the method used in the kitchen is more common still: the rind is scraped off by the grater, or a piece of lump sugar is rubbed over the rind. In any case the object is to break the oil-ducts and press out the essential oil. Most of the essence or oil of commerce is obtained by distillation.

By maceration is understood the process by which the essential oil of delicate flowers and plants is obtained. Melted fats have the power of absorbing essential oils from vegetable substances. The petals of flowers are placed in

melted fat and allowed to rest there until they have parted with their perfume. They are then removed, and fresh ones put in their place. This is continued until the fat has absorbed the required amount of perfume. In the kitchen this principle may be used to advantage in the cooking of certain vegetables. (See "Cause of Strong Odors, Flavors, and Colors in Vegetables.")

Drying and non-drying oils.

The fixed vegetable oils are obtained from seeds and fruits. These are sometimes crushed and pressed cold, sometimes heated and pressed, and sometimes boiled in water, to extract the oil. The oils procured in this way may be divided into two classes —*drying oils* and *non-drying oils.*

Nearly all fixed oils absorb oxygen freely when exposed to the air. The effect of the oxygen is to cause the oils either to harden or to turn rancid. The oils that harden are called drying oils, and those that turn rancid are known as non-drying oils. The drying oils that the housekeeper has most to do with are the three forms of linseed-oil—common linseed-oil, cold-drawn oil, and boiled oil.

The common linseed-oil is obtained from the crushed seeds heated nearly to the boiling-point and then pressed. This oil is brown in color.

Cold-drawn linseed-oil.

Cold-drawn linseed-oil is obtained by pressing the crushed seeds without heat. This oil is of a light color and is more expensive than the common oil.

Boiled linseed-oil is the pressed oil boiled for an hour or more with powdered litharge, sulphate of zinc, sugar of lead, or some other substance to increase the drying power.

Boiled linseed-oil.

In oiling floors and other surfaces where it is important that the oil should dry quickly, the boiled linseed-oil should be used. Indeed, the boiled linseed-oil should always be used on the floors and inside finishes of the house.

Alcohol dissolves linseed-oil, as do turpentine and kerosene to some extent. When oiled surfaces, like floors, become dark and soiled because the boards were not properly polished after the oiling, they may be cleaned with turpentine or kerosene, unless the stain is of long standing, in which case alcohol may be used. Hot alcohol has a much greater solvent power than the cold. If the alcohol is to be used hot, it should be put in a bottle, which may be placed in a dish of tepid water. Heat the water gradually to the boiling-point. Keep the bottle in the hot water while applying the alcohol to the floor.

Effect of alcohol on linseed-oil.

Linseed-oil being a fixed oil, and containing a resinous substance, particles of dust are apt to attach themselves to the surface on which it has been used, unless there has been great care in polishing. By combining the linseed-oil with alcohol, turpentine, or even with kerosene, a volatile element is added, and the process of polishing and drying is hastened.

For woodwork that requires a thorough oiling nothing but a little turpentine should be added; and for an outside exposure, like doors, piazza floors, etc., only the pure oil should be used, and in this case the ordinary oil answers all purposes.

Paraffin-oil is a product of petroleum, or of the distillation of bituminous bodies. It is the oil that passes over *after* kerosene, and is a much heavier oil than the latter. This oil must not be confounded with the solid white paraffin, a great portion of which is obtained from petroleum and bituminous products. Nor must it be confused with the English paraffin, which is the kerosene manufactured from bituminous bodies.

Paraffin-oil.

Paraffin is a pale-yellow oil. It contains little, if any, resinous substance, and it is excellent for polishing furniture or woodwork when a very *fat* oil is not required. It

may be used in the pure state, or mixed in any proportion with alcohol, turpentine, or vinegar.

LUBRICATING OILS

Essential qualities in lubricating oils.

Some of the qualities essential in the lubricating oils in use in the household are: "(1) Freedom from a tendency to gum or oxidize; (2) sufficient body to keep the surfaces between which it interferes from coming in contact; (3) the greatest fluidity consistent with 2; (4) absence of acid and other properties injurious to materials in contact with it" (James Cameron).

Kerosene oil will dissolve gummy substances.

The housekeeper will find the best sewing-machine oil sufficient for all lubricating purposes. Half a pint or even half a gill of this oil will last a long time. For lawn-mowers and such heavily working machines a good sewing-machine oil is all that is required. Even when exercising the greatest care in purchasing a lubricating oil, one sometimes gets one that is adulterated with a resinous oil. In that case the article oiled "gums up" and will run hard. Kerosene-oil will dissolve this gummy substance. Pour it on the article freely (first, of course, protecting floors and other near-by objects), and set the machinery, door-hinges, locks, or whatever may have been "gummed," in rapid motion. Then clean off with a soft, clean cloth, and oil with the machine-oil. It must be remembered that kerosene merely cleans; it is not a lubricating oil.

No drying oil, or intermediate oil, *i. e.*, half-drying oil, such as castor-oil, cotton-seed oil, etc., should be used as a lubricating oil.

CLEANING OILS

Among the cleaning oils, the most important are gasolene, naphtha or benzene, benzole, and oil or spirits of turpentine.

These oils are exceedingly volatile, and give off inflammable vapors. When using them for cleaning, the room in which they are should be well ventilated, and care should be taken not to bring them near fire, lamps, candles, or any other light.

Cleaning oils are volatile and inflammable.

Oil or *spirits of turpentine* is made from the pitch-pine tree. The bark of the tree is removed, and the resinous liquid is collected and distilled with water. What passes over is oil or spirits of turpentine; the residue remaining in the retorts is rosin. Oil of turpentine, when fresh, has not a strong odor, and is clear in color. On exposure to the air it absorbs oxygen, darkens, becomes resinous, and acquires a strong odor. It should not be used for cleaning fabrics when it is old, as it will then leave a stain of its own.

Must not be used in cleaning if old.

Turpentine dissolves grease, wax, and tar. It is useful in cleaning waxed surfaces, and is sometimes used in the laundry for whitening clothes. It is valuable for making preparations of either wax or oil, for polishing wood and tiles, and it is also valuable as a medicine. It is one of the articles that it is wise to have always in the house; it should be kept in a well-corked bottle.

Benzene and *naphtha*. The substances sold under these two names are practically the same thing, although benzole, being a French term for benzene, is sometimes sold under that name.

Benzene and naphtha.

Naphtha is a product of petroleum. It is the oil that passes over after gasolene and before kerosene. As it is exceedingly volatile and gives off inflammable vapors, the greatest care must be taken in using it in the house. Windows should be opened, that the vapors may pass out at once.

If it is properly used it is one of the best friends the housekeeper has. It dissolves fats, turpentine, asphalt, and rubber. Being volatile, it may be poured on clothing, car-

pets, furniture, floors, etc., without fear, for in a few hours every trace of it will have disappeared. It also kills insects and vermin. But there is apt to be danger in its use, as the volatile vapors, when mixed with oxygen, are so inflammable.

Great danger in use of naphtha, owing to its inflammable qualities.

With *windows open*, however, and an entire *absence* of *fire* or *light* of any kind, there is no danger, and the housekeeper may clean her fabrics, pack away her furs, flannels, rugs, etc., with perfect ease and safety by the aid of this agent, provided she superintends the work, or does it herself, and takes the precautions here outlined. After naphtha has been used in a room, the windows of that room should be left open for several hours, or, better, they should remain open all day. If one finds that some room or bed in the house has become infested with bugs, two thorough applications of naphtha will exterminate them.

Naphtha will exterminate bugs.

Articles that have been cleaned with naphtha should be aired for some time before they are brought near a lamp or fire.

Benzole, or *benzene*, as it is sometimes called, is one of the products of coal-gas manufacture. It is made from coal-tar, and acts very much like naphtha. It evaporates a little more rapidly, perhaps, and thus is less likely to leave a trace of its use on delicate fabrics.

Benzene product of coal-gas.

Gasolene is a product of petroleum. It is a more volatile oil than naphtha. When petroleum is being purified, gasolene passes over at a lower temperature than naphtha. It is an excellent agent for cleaning; the most delicate fabrics may be soaked and washed in it. However, the same precautions that must be taken in using naphtha are required in using gasolene. Gasolene-stoves should not be filled, moved, or jarred violently while lighted.

Care must be exercised in using gasolene.

OILS USED AS FOODS AND MEDICINES

The oils used as foods and medicines belong to the non-drying or intermediate class of oils. The non-drying oils absorb oxygen, as do the drying oils; but the effect of the oxygen is to cause them to grow rancid; therefore, in keeping them, they should be protected from the air.

Effect of oxygen on non-drying oils.

Olive-oil, also known as sweet-oil or salad-oil, is made from the unripe fruit of the olive-tree. There are several grades of this oil, the finest being the virgin oil. In making this oil the fruit is torn, not crushed, and very little, if any, pressure is used. This process gives an oil of the finest and most delicate flavor. By this means only a small portion of the oil is extracted from the fruit. The second grade of oil is made by pressing the cold pulp of the fruit from which the virgin oil has been extracted, in bags or baskets made from some inodorous material. The third grade is made from the pressed pulp, which is mixed with cold water and pressed again. This pulp is treated with water once more, heated, and pressed.

Olive-oil.

Another method is to subject the pressed fruit to a gentle heat after the virgin oil has been extracted, and to press the oil out. Still another method is to mix the crushed fruit with boiling water and then press. Sometimes the crushed fruit is allowed to ferment before the pressing, or the fermented fruit is boiled in water and the fat skimmed off. Finally the different waters from which the oil has been skimmed are allowed to stand, and the particles of oil that collect on them are skimmed off. This last is the poorest of all the oils, and is known as the oil of the infernal regions. It is used for oiling stone and tiled floors, and in making soap.

Much of the olive-oil sold at the present day is adulterated

with other oils, such as cotton-seed oil, lard-oil, nut-oil, poppy-oil, etc. Pure olive-oil has a slightly greenish-yellow tinge, little odor, and does not become rancid easily. When chilled to the freezing-point it begins to congeal in a granular mass. It may be heated to 600° F. without burning, and it is one of the pleasantest and most healthful of all the oils used as foods. Olive-oil should be kept well corked in a cool, dark place. The cork, on being removed from a bottle of fresh oil, should be washed, and the inside of the neck of the bottle wiped with a clean cloth. Sometimes the cork is dipped into an inferior oil to make it slip into the bottle with ease; hence the necessity of cleaning the neck and cork, that the oil in the bottle may not be contaminated. Formerly we depended upon Italy and France for our supply of oil, but now we get a good article from California.

Adulteration and color.

California furnishes good oil.

COTTON-SEED OIL

This oil is made from the decorticated seeds of the cotton-plant. In its present commercial form it is of comparatively recent date.

The refined oil is of a pale-yellow tone; it has a very slight odor and a nutty flavor. It solidifies at about the freezing-point. Cotton-seed oil belongs to the class that stands between the drying and non-drying oils. At its best and purest it is often employed as a substitute for olive-oil. It has not the fine, delicate flavor or texture of olive-oil, and can never replace it in the more delicate cookery; but it is a pure, healthful vegetable oil, and one which will grow in favor as a food adjunct.

Characteristics of cotton-seed oil.

This oil is combined with beef suet and other suets, and sold under various names. The initial syllable of the names

of these compounds usually indicates that the cotton-seed oil is one of the ingredients. The addition of these suets gives a certain amount of solidity to the compound, making it possible to use it for purposes for which the liquid oil would be impracticable.

Suets are added to give it solidity.

When the oil itself, or one of its compounds, is used for frying, the odor remains in the room more persistently than that of any ordinary frying-mixture. No doubt the manufacturers of the oil will overcome this, as they have many other defects.

The oil should be kept closed from the air and in a cool place.

CASTOR-OIL

This oil belongs to the class of drying oils. When pure it is thick, clear, and of a pale-yellow color. When old or of inferior quality it is a greenish brown. Exposure to the air and light turns it dark and rancid. It is one of the safest and least irritating laxatives employed in the practice of medicine. Physicians are coming back to a more general use of it than has been the custom for a number of years.

A dose of castor-oil is a nauseating one, unless thoroughly disguised. There are several methods of doing this. Some liquid with a pronounced flavor is poured into a glass, the amount of castor-oil necessary for the dose is poured on this, then the oil is covered with another layer of the liquid, so that the patient takes the masked oil without tasting it. Lemon-juice, strong coffee, brandy, whisky, etc., are some of the agents used for this purpose.

Various methods used in disguising the oil.

COD-LIVER OIL

This oil is obtained from the liver of the cod. The best quality for medicinal purposes is manufactured with great

care. The livers are taken from the fresh cod, those that are not perfectly healthy being discarded, and the selected livers are freed from membrane and thoroughly washed. They are then chopped fine and put into a vessel which is surrounded with a steam-jacket, and they are subjected to a heat of about 100°. The oil is drawn off and filtered, after which it is ready to be packed into air-tight vessels. Cod-liver oil is sweet and of a bright amber color. This bright amber color should be the test in purchasing the oil for medicinal purposes.

Method of obtaining cod-liver oil.

Cod-liver oil is a most valuable food adjunct in pulmonary diseases, or in any condition of the body in which fat is not properly assimilated. It is often readily digested when the amount of other foods necessary to nourish the body cannot be taken.

Nourishing effect of cod-liver oil.

Its effect is to nourish the tissues of the body, thus giving strength; and in cases of consumption it checks the exudations of tubercular matter, and also diminishes the cough and perspiration.

This oil should be kept excluded from the air.

SPONTANEOUS COMBUSTION

"Some of the fixed oils, especially linseed-oil, rape-seed oil, and olive-oil, when absorbed by porous substances and freely exposed to the atmosphere, unite with oxygen so rapidly as to generate a considerable degree of heat. Hence paper, tow, cotton-waste, wool, shoddy, hemp, straw, shavings, etc., if slightly soaked with such oils and left in a heap, inflame spontaneously.

"Spontaneous combustion ensues when a handful of cotton-waste is imbued with oil and placed in an air-bath at a temperature of 130° F. to 200° F. Boiled linseed-oil requires an hour and a quarter, raw linseed-oil four hours,

lard-oil four hours, refined rape-seed oil about nine hours, to inflame.

"Gellatly found that an admixture of twenty per cent. of mineral oil retards combustion, and fifty per cent. prevents it completely." ("Oils and Varnishes," by James Cameron; London, J. & A. Churchill.)

CHAPTER XV

STAINS

Stains on fabrics. Stains on wood.

STAINS ON FABRICS

Always try, first, the simple remedies for removing stains.

Stains of all kinds are of constant occurrence in the household. There are many simple remedies for removing most of them. The simplest methods should always be tried first. Remember that the chemical which removes the stain will generally attack the fabric, and therefore should be resorted to only when harmless remedies have failed. Nearly all stains are easily removed when first made; after they have dried in the fabric, or, worse still, if they have been washed with soap, the stain is fixed and is difficult to remove.

Water is one of the very best agents for removing stains when they are first made, and it has this advantage: it does not injure the material.

Value of chemicals if properly used.

Chemicals are very valuable when used properly; but it must be remembered, when using them, that the moment they have done their work in removing the stain they should be removed by rinsing in abundance of cold water, this followed by a neutralizing agent, which should also be followed by a thorough rinsing. If an alkali, such as caustic soda, caustic potash, or lime, is used, the neutralizer may be a few drops

of acetic acid in a pint of water; or, failing in that, any acid, like vinegar or lemon-juice, may be employed, in which case teaspoonfuls will be required to take the place of the drops of the acetic acid; that is to say, five or six teaspoonfuls of vinegar or lemon-juice will be required to replace one of acetic acid.

In cases where acids have been employed to remove stains, neutralize with a solution of ammonia—about a tablespoonful of household ammonia to a pint of water.

One must know the nature of the stain to remove it successfully.

If one knows the nature of the stain, the work of removing it may be undertaken more intelligently and with better success than if working in the dark. The agent that will generally remove grease-spots—warm water and soap—will often fix fruit and other stains.

Cold, tepid, or hot water may be used on most stains, and although it will not always remove them, still it will rarely fix them. Blood stains, however, are fixed by hot water, and softened and partially removed by cold or tepid water.

Sometimes the agent that of itself makes a stain is useful in loosening or changing the character of another stain, as, for example, the wetting of a black-ink stain with red ink, or when lard is rubbed on the black stain that sometimes gets on articles made on a sewing-machine.

When an article becomes stained, the first care is to learn the nature of the stain; then the remedies may be applied.

Ink Stains.—Nearly all ink stains may be removed if treated at once; but even then there is a great difference in the readiness with which the various preparations of ink yield to prompt and careful treatment. For example, a stain from some stylographic ink may be removed by thorough washing with soap and water, while in the case of others the stain must be soaked in milk or some other substance for a long time, even after it has had a thorough

washing in water. The stains from some makes of ink yield only to a chemical, and even the strongest chemicals are sometimes powerless.

Cold or tepid water never fixes a stain; neither does milk; therefore these are always safe to use in removing the greater part of the ink. If it is necessary to use other agents after this, the work will be more rapid, and there will be less danger to the fabric than if the chemical were required to remove all the ink.

To remove ink by soaking in water or milk.

When ink is spilled, if it is an article that may be put into a basin of water, do this immediately, rinsing the stain in repeated waters until no more ink can be removed in that way; then soak in hot or cold milk, sweet or sour. This treatment may remove the stain at once, or it may require several days' soaking in the milk. In some cases, however, there will remain a distinct dark stain, which may be removed by soaking a few minutes in Javelle water or in a weak solution of chloride of lime, or acids may be employed to remove the stain.

How to remove ink-spots by absorption.

Should the ink be spilled on a garment, carpet, floor, table, or other article that cannot be washed and soaked in this manner, cover the stain at once with some absorbent, like starch, flour, meal, shredded blotting-paper, etc. These substances will absorb the superfluous ink and prevent it from spreading over a larger surface. After a few minutes remove the first application of absorbent, and cover the spot with fresh material. Continue to do this until the substance applied is no longer soiled by the ink.

Using a lemon to remove spots.

If you have a lemon at hand, cut off one end and take off about an inch of the peel, going over the stained surface with the cut end of the lemon, rubbing gently. When the lemon becomes soiled,

cut it off, and go over the stain as before; continue this, paring the lemon a little at a time, and trimming off the end as it becomes soiled. If this has removed all the ink, rinse the spot with cold or tepid water, using a sponge or soft cloth.

Should there be no color to injure in the stained article, the surface may be sprinkled with common salt before each application of the lemon.

The foregoing method is for fresh stains. Any of the following methods may be employed for old stains.

1. **Lemon-Juice and Salt.**—Spread common salt on the stain, and wet with lemon-juice; place in the sun. Repeat every day until the stain disappears, rinsing the spot in clean water before each new application of salt and lemon. When the stain is removed, wash the fabric, and rinse thoroughly.

2. **Oxalic Acid.**—With a sponge or piece of soft cloth, rub the stain gently with a strong solution of oxalic acid. When the stain disappears, rinse thoroughly, and neutralize with weak ammonia water. Or wet the finger in water, dip it in powdered oxalic acid, and rub gently on the stained spot; continue this until the stain disappears. If heat can be applied, the stain will disappear more quickly. Wash and neutralize.

3. **Oxalic Acid and Cream of Tartar.**—Mix together one teaspoonful of powdered oxalic acid and one of cream of tartar. Spread a little of the powder on the stain, and moisten with lemon-juice or water; rub gently with the finger; repeat until the stain is removed. Do this with heat, if possible. Wash and neutralize.

In the three foregoing methods the work is hastened if the material worked upon is warm. If the spot is not large, the heat can be applied in this manner: put a plate over a kettle of hot water, and spread the stained part of the article on this; then work as directed. Use water or lemon-juice hot.

How to apply heat on small spots, also on carpet or furniture.

If the stain is on a carpet, floor, or piece of furniture, first make the spot warm by placing a warm iron or any other warm substance on it; then fill a flat-bottomed earthen or china basin with boiling water; wet the stained spot with the mixture to be used, then place the hot basin over it. In about two minutes remove the basin, and rub the spot with fresh mixture; cover again with the hot dish. Follow this until the stain disappears.

It must be remembered that oxalic acid is a poison, and should be so marked, whether it is in the liquid or the powdered state.

With Red Ink.—Wet the ink stain with red ink, and wash in clear water, then in soap and water. This method will remove some ink stains, but not all.

With Muriatic Acid.—Wet the stain, and spread it over a bowl of boiling-hot water. Rub the spot gently with a glass stopper wet with the acid, then plunge the spot in the hot water. It may be necessary to repeat this several times. Rinse the article in ammonia water, and then in several clear waters.

With Javelle Water.—Cover the stain with Javelle water, and let it soak until the stain disappears. Sometimes this will be in a few minutes, and again it may take a long time. There are but few stains that resist this treatment. Rinse in ammonia water and in clear water.

With Turpentine.—Soak the stain in turpentine and then rub gently. This may be used on colored fabrics. The acids and other strong chemicals should not be used on colored articles.

Sun and air will often aid materially.

Sometimes the sun and air will complete what the agents used have only begun, and a stain that seemed to be fixed indelibly often disappears when hung in the open air.

Ink stains on painted or varnished surfaces may generally be removed by encaustic No. 2. When the wood is unfin-

ished the stain sinks into the fibers, and must be removed with a strong solution of oxalic acid. When the stain is obstinate, add a teaspoonful of cream of tartar to a gill of the oxalic-acid solution.

Blood Stains.—When the article stained is one that may be washed with soap and water there is no difficulty in removing blood stains. Soak the article in cold or tepid water; wash from this water, and then wash in warm water, using plenty of soap. A white fabric may be boiled. If the stain is on a fabric or surface that cannot be washed, cover with wet starch. When the starch dries, rub it off, and repeat the dose of wet starch; continue this until the stain disappears.

Green Stains, from grass or other vegetable substances, may be removed with alcohol or kerosene. Wash the stain in kerosene (it will turn yellow), then wash with soap and water, and the stain will disappear; or wash in alcohol.

Soot Stains.—These stains must always be treated with a dry solution if the stain is on a carpet or other fabric. Rub the spot with any of the following materials (continue removing the soiled material and add fresh until the stain has disappeared): starch, flour, corn-meal, fullers' earth, and salt.

When the stain is on marble or wood, remove the greater part of it with dry materials, and then wash with soap and hot water.

Running Colors.—When an article has been stained by coming in contact with a colored fabric that has been wet with water, as a rule the stain may be soaked out. As soon as possible after discovering the accident, put the article to soak in plenty of cold water; at the end of ten or twelve hours wash it out of this water, and dry in the sun.

Iodine Stains.—Wash the stain with alcohol, then rinse in clear water, if the material may be washed.

Vaseline Stains.—The stains from vaseline are most diffi-

cult to remove. Ether seems to be the only liquid that will dissolve vaseline. Sponge the stain with it. This is too expensive an agent to use in large quantities.

Iron Rust may be removed by muriatic acid, oxalic acid, or lemon and salt. Have a bowl of boiling water. Spread the stained place over this; touch with the muriatic or oxalic acid, and when the stain changes to a bright yellow dip it in the water. Rinse the fabric in ammonia water and then in clear water. The salt and lemon-juice may be applied in this manner or on a hot plate, or the wet stain may be put in the sun. Being a weaker agent than the muriatic or oxalic acid, the lemon and salt take a longer time to remove the rust. To remove rust from iron or steel, wet the stain with sweet-oil, then cover with powdered quicklime. In a day or two rub off the mixture. If all the rust has not disappeared, repeat the application of oil and lime, then clean with oil and rottenstone, if the articles happen to be of steel; if common utensils, wash in strong soda-water, rinse with soap-suds, and wipe very dry.

Fruit Stains.—Spread the stained article over a large bowl, and pour *boiling* water through it until the stain disappears; or soak the stain for a short time in Javelle water. Another method is to soak the article in a weak solution of oxalic acid. The last two methods are to be employed only when the boiling water has failed, which it rarely does if used at once, except in the case of peaches, which make a stain very difficult to remove. Fruit stains may be removed with the fumes of sulphur. Wet the stain. Make a small funnel of stiff paper, and cut a piece from the small end; then place a bit of sulphur in a saucer, and set it on fire, covering it with the funnel. Hold the wet stain over the small opening, and when clean rinse thoroughly. The work must be done by an open window, and the operator must be careful not to inhale the fumes. When you have finished, extinguish the burning sulphur by covering it with a piece of

wet paper. A small stain may be removed by burning a sulphur match under the wet spot.

Wine Stains.—Cover the spot with salt, and at the first opportunity pour boiling water through it. Should the stains have become fixed from having been washed with soap, use any of the methods given for fruit stains.

Tea and Coffee Stains.—Treat these the same as fruit stains.

Chocolate and Cocoa Stains.—Wash with soap and tepid water.

Paint and Varnish.—Alcohol and turpentine dissolve these two stains. Use turpentine on coarse fabrics, and alcohol on delicate ones. If there is a suggestion of a stain after the paint or varnish is removed, sponge the spot with chloroform or ether.

Grease-Spots.—When an article is washable, grease-spots may be removed with soap and water. Grease-spots may generally be removed by the application of a substance that has an affinity for grease. The simplest of all methods for removing grease is by absorption. Powdered French chalk or fullers' earth, mixed to a paste with water or turpentine, and spread on the grease-spot, will absorb it. This should be allowed to stand for several days, and the application then brushed off. Sometimes a second application of the paste may be necessary. For dark materials ox-gall is sometimes used with the turpentine and fullers' earth. If the ox-gall is decolorized, it may be used on light materials.

Blotting-paper may be put under and over the grease-spots; a warm iron should be placed on the top sheet of paper; change the paper until all the grease has been absorbed. The spot may then be lightly sponged with chloroform or ether.

Candle-grease should always be scraped from the surface of the article before an absorbent or other agent is used.

When the fabric is very delicate, as, for example, light

silks or cloth, try dry French chalk. Spread it on the stain, cover with blotting-paper, and if time will not permit its standing for twenty-four hours or more, use a warm iron.

Methods for delicate fabrics.

Ether, benzene, naphtha, chloroform, turpentine, and alcohol all dissolve grease. Only the most volatile agents should be used on delicate colors; chloroform, ether, benzene, naphtha, and alcohol are, in the order given, the most volatile. Alcohol is more liable to affect the color than are the other agents.

It must be remembered that these liquids dissolve the grease, and that the operator must remove it by sponging the spot gently. Well-washed cheese-cloth is one of the best fabrics to rub with, as it does not leave lint, and is so cheap that one may use a clean piece with every application.

When cleaning with any of the dissolving agents it is important that the diluted grease does not spread over a larger surface than the original spot. Spread the fabric, and place a piece of blotting-paper under the stain. Spread a ring of French chalk or fullers' earth around the grease-spot; then wet a cloth with the cleaner, and rub gently toward the center of the spot. Work in this manner, changing the cleaning-cloth frequently, until the spot has disappeared. Rub gently with a dry cloth until the spot is perfectly dry. If any of the less volatile agents have been used, and there is a slight ring around the cleaned spot, sponge gently with chloroform.

How to prevent the grease spreading on the fabric.

Acid Stains.—When any common acid, such as lemon-juice, vinegar, muriatic acid, etc., is spilled on a colored fabric, it often changes the color. If the spot is lightly sponged with a dilute solution of ammonia,—one tablespoonful of household ammonia to four of cold water,—the color will be restored. The work must be done carefully, only touching the changed spot with the ammonia preparation.

Alkali Stains.—Stains made with the ordinary alkalis should be sponged lightly with a diluted acid, vinegar, acetic, or muriatic. Let the preparation be *very weak*, and sponge the spot lightly.

White boards, matting, etc., spot a reddish brown when liquid potash is spilled on them. Wash such spots with dilute muriatic acid, one tablespoonful of the acid to two of water; then sponge with clear water.

Caution.—When mixing muriatic or sulphuric acid with water, always add the acid to the water a little at a time. Great heat is generated by the combination of the water and acid.

Pitch, Tar, Wheel-Grease Stains.—Spread lard on such stains to soften them; then wet with turpentine. With a knife gently scrape off all the loose dirt. Wet again with turpentine and remove the dirt with the knife. Continue this until all the loose dirt has been removed; then sponge with turpentine, and rub gently until dry. If the colors are light, finish by sponging with chloroform.

Mildew.—The removal of this kind of stain is more or less difficult, depending upon the thoroughness with which the fabric has been affected by the mildew. Light and recent stains may often be removed by wetting them, rubbing on soap, and then covering the spots with wet starch. Spread the article in the sun, and renew the application of starch and soap frequently.

Chloride of lime and Javelle water are both effective agents for the removal of mildew. In light cases the stain may disappear in less than half an hour, but where the stain is of long standing it may take twelve or more hours. Soak the article in Javelle water or a solution of chloride of lime until the stain disappears; then rinse thoroughly in several waters. (See "Javelle Water" and "Chloride of Lime.") This treatment is only for white fabrics.

Scorched Stains.—Wet the scorched place, and rub soap

on it. Spread in the sun. Cover the spot with a thin mixture of starch and water. It may require several applications of the soap and water and starch.

STAINS ON WOOD

Wood, finished and unfinished, is easily stained by various substances. In the unfinished wood the staining substance sinks into the pores and is difficult to remove; but, on the other hand, chemicals and other substances may be used with greater freedom and safety on unfinished surfaces than on varnished and painted woods, marbles, etc.

Alcohol stains.

Alcohol dissolves the gums from which varnishes are made. Therefore, if alcohol, or any substance of which alcohol forms a large part, as perfumery, sweet spirits of niter, etc., is spilled on a varnished surface, the varnish at once begins to soften. The purer the alcohol, the more rapidly it dissolves the gum. If one attempts to wipe the spot after the softening has begun, the varnish comes off on the cloth. Instead of wiping off the alcohol, neutralize it by pouring on some oil. Any kind will do, but sweet-oil, paraffin-oil, or linseed-oil is to be preferred.

To remove white stains from wood.

A surface that has been stained white with alcohol, or any alcoholic substance, may often be restored to its former color and polish by rubbing it with kerosene, with oil and turpentine, or with oil and alcohol. If the stain is very deep, use oil and rottenstone or the Furniture Cleaner and Polisher (see recipe).

To remove roughness, and stains made by heat.

When the surface has been made rough as well as stained, rub it gently with the finest emery-paper, dust, oil, and then polish with rottenstone and oil.

Stains made by heat may, if they are not deep and are of short standing, be removed by rubbing them with hot milk. Kerosene, or any of the methods given for alcohol stains, may be used.

Ink may be removed from finished surfaces by rubbing the spot with encaustic No. 2. Oxalic acid is also an efficient remedy. It may be poured on the spot, allowed to stand awhile, and then wiped off. If that does not remove the stain wholly, add more acid, and rub with a soft cloth. Sometimes several applications of the acid may be necessary. This is particularly the case with a porous substance, like unfinished wood.

To remove ink stains from wood.

Black stains caused by water or other liquids soaking into wood may be removed by pouring the oxalic acid on them, as suggested in the treatment of ink stains. The acid removes the color also, so that it should not be used when a less powerful agent will answer. Of course, if the color is taken out it must be restored. (See "To Restore Color and Finish to Woods.")

To remove stains caused by water, etc.

Grease stains on oiled, painted, or varnished surfaces may generally be removed by hot water and soap; on the unfinished wood this is not so easy a matter. A more certain method is to absorb the grease by some substance, or to combine it with an alkali; both of these remedies may be used at the same time. A hot solution of potash may be poured on the grease-stained board, or, if one has wood-ashes, a quart of ashes and a quart of water may be simmered together for an hour, and then poured on the spot. If the grease stain is from hot fat, these solutions will have to be renewed several times.

To remove grease.

These strong alkalis leave a dark or yellow stain on the white boards. To avoid this, make the solution into a thick paste with lime. This paste should stand on the floor at least twelve hours. On handsome floors use fullers' earth and a weak solution of sal-soda.

To remove grease by absorption and an alkali.

CHAPTER XVI

MISCELLANEOUS MATTER

Some points on laying floor-coverings. The finishing, filling, and staining of floors. How to prepare the filler. Staining with chemicals. The preparation and application of stains. Summary. Points on mixing stains. Stains made from colors ground in oil. Stains made from colors in powder. To graduate the stains. Things important to remember. Gluing furniture and other articles. How to mend plaster casts and picture-frames. To clean plaster casts. To wax and stain casts. Care of small marbles and alabaster. To clean bronzes. To polish the brass trimmings of furniture. Some uses of lime-water. Chloride of lime. Liquid soda. Javelle water. Carbolic acid. Solution of oxalic acid. Furniture-cleaner and -polisher. Encaustic No. 1. Encaustic No. 2. Wax for polishing furniture. Materials for care of furniture and floors. Fullers' earth. To clean with fullers' earth. To make scouring-balls. To clean with scouring-balls. How to put new linings in boots and shoes. To clean combs and brushes. To clean coat collars. Aids in darning large holes. How to revive and straighten whalebone. To prevent stains showing through whitewash or paper. To prevent the corners of rugs from curling. How to heat inflammable substances. Precautions to be taken in cleaning. Frames for dress-waists and men's clothing. Convenient clothes-rack. Steel wool and steel shavings. Insects and vermin. Cockroaches. Thermometers in the kitchen. The melting-point of some metals and alloys. The melting-point of some fats and sugar. Bacteriology. Household accounts, and the division of the income.

SOME POINTS ON LAYING FLOOR-COVERINGS

Carpet.—The durability and appearance of carpets, as well as the comfort of those walking on them, depend largely upon the manner in which the carpet is laid. Seldom can an amateur do this work as well as a trained workman, and

although one may save a few dollars by laying the carpet one's self, it will be an expensive kind of economy unless it is well done.

Necessity of smoothly laid carpets.

A carpet of any kind that does not lie perfectly flat gets twice as much wear as one that fits snugly to the floor. A loose carpet moves about under the feet; and a stiff material, like oil-cloth, linoleum, or matting, cracks in the slight folds that are made.

The surface on which the carpet is laid has much to do with its durability. If the floor is rough and uneven, the carpet will not wear as long as if laid over a smooth surface.

Lining for carpets.

Woolen carpets should always have a lining under them; the smoother and more even the lining, the better. There are many varieties of manufactured linings that are excellent for this purpose. If one cannot afford the prepared linings, thick layers of newspapers will answer. The regularly made pads should be used on the stairs.

Matching figures carefully.

The floor on which the carpet is to be laid must be measured accurately. If the carpet has a pattern, it should be studied carefully so that the breadths may be joined with the figures matching. Allow for turning in at the ends. In sewing the carpet be careful to get it firm and strong, and see that it does not full in the seam.

Method of laying a carpet.

Lay the lining, and fasten it in place with the smallest kind of a tack. Spread the carpet in position. Begin at one end, driving a few large tacks half-way into place, so that they may be easily drawn out. This is to hold the carpet until it is tacked around the fireplace, in case there is one. Now with large tacks get the carpet laid smoothly around the mantel, then tack it regularly. Work back from the mantel to the end where the carpet is held in place with the large

tacks. Readjust the end, and tack it firmly, drawing the carpet very tight as you tack it.

Begin at the other side of the mantel, and tack that side. The carpet being tacked at one end and one side, it must now be stretched, pulling it from the tacked sides and ends. Put in large tacks, which may be drawn out again, to hold it in position.

Begin tacking at the opposite end of the room, using the stretcher continually; then finish by tacking the sides, still using the stretcher. Two people can lay a carpet better than one, because one can tack while the other holds the carpet firmly in place.

Measure carefully.

The most careful measurements must be taken, first for the lengths of the carpet, and next for the places that must be cut—for example, to fit round a mantel, doorway, or register.

Manner of cutting carpet for register.

If there is a register, the space to be left open should be measured and marked with chalk. The center of the space may then be pierced by the shears, and the cutting done like this,

Fig. 51.

following the dotted lines. The pieces may be turned under, and if at any time there should be need of changing the carpet to another room, they may be darned together. In fitting the carpet to angles and jogs, the cutting should be done, when possible, in such a manner that the places cut may afterward be sewed together, if necessary.

To lay matting.

Matting.—If the floor on which matting is to be laid is not smooth, cover it with papers. Cut the pieces of matting long enough to admit of their being

turned under. When a half-breadth must be used, the side that is cut should be bound and placed next to the wall. One breadth of matting should never lap over another.

When of the best quality, Canton mattings wear as well as a Brussels carpet. The breadths are never sewed together; they may be laid so smoothly as to seem almost a part of the floor. The cheaper grades, being woven loosely, do not rest so firmly on the floor, and are easily broken. They are expensive at any price.

Japanese mattings.

Japanese mattings are very soft, pliable, and beautiful. The best are woven on a cotton or linen warp. They are sometimes sewed together like a woolen carpet, and are also tacked down edge to edge, as in the case of the Canton mattings. When sewed they do not lie as smoothly as when each breadth is tacked separately. Whether the mattings are sewed or tacked, pains should be taken to have them fit the floor as closely as possible. In laying matting, use the double tacks when two edges come together, and the single ones for the outside edges. When binding is used on a cut edge, match the shade of the matting as nearly as possible. Old holland shades make an excellent binding for matting.

Laying Japanese mattings.

Mats of matting.

Pretty mats can be made of the Japanese matting. Cut the mats the size desired, draw out strands at both ends sufficient to make a fringe, and overcast the edges.

It is a good plan to purchase enough of the matting to cut up for these mats, which may be placed where there is the most wear. They are so fine and thin that they seem almost a part of the floor-covering.

Oil-Cloth and Linoleum.—These coverings always stretch after they have been on the floor awhile. When measuring them, an allowance of half an inch should be made on all sides for stretching. After they have been in place a few

weeks, it may be found necessary to trim the edges an inch or more. If the carpet begins to bulge up anywhere, immediately examine the edges, and you will find that they are pressing against the walls. The trimming of the edges should be done at once; for if the covering lies too full, even for a short time, it will begin to crack, and its durability will be greatly diminished.

Tendency of linoleum and oil-cloth to stretch.

THE FINISHING, FILLING, AND STAINING OF FLOORS

The workmen who lay the floor generally finish it ready for the polisher. This is the case with all fine floors, but every one cannot afford perfectly made and finished floors. Many people would be glad to dispense with carpets, if they knew how to finish the ordinary floor so that it would look well and could be cared for with ease. This chapter is written for such people.

The kind and quality of wood determines the treatment to be given the floor. A hard, close-grained wood will not require a filler, and it will take a higher polish than the soft woods.

We will take any common wood floor, just as the carpenter has left it. It has been planed off, but the surface is not perfectly smooth. The first step toward preparing this floor is to rub the boards down to absolute smoothness. For this purpose get a package of steel wool, or steel shavings, of medium coarseness. (See "Steel Wool and Steel Shavings".) Put on thick gloves. Take a wad of the wool in your hand, and rub one board at a time until smooth. In rubbing let the movement be regular, but not too heavy. When the whole floor has been gone over, brush up the dust, and if the wood be open-grained, go over it with the filler, rubbing it in with a cloth. Close the room,

First step toward preparing the floor.

Application of the filler.

and let the floor rest for a day or more; then rub it down with clean, fine excelsior. A second coat of filler and a second rubbing down with excelsior will make the finish of the floor doubly fine; but the one coat will do, if time and strength fail.

Now brush the floor, and with a damp cloth wipe off all the dust. It is now ready to be waxed or oiled.

HOW TO PREPARE THE FILLER

Prepared fillers may be bought at any paint-supply shop, or they may be prepared at home. The object in using them is to fill in the minutest interstices in the wood, and so give a uniformly even surface. The foundation of wood-fillers is oil, turpentine, and either whiting, corn or other starch, or flake-white. A drier is often used. If the wood is dark, or the floor is to be colored, enough coloring-matter is added to the mixture to match the color of the boards or the color one wishes them to have. Sometimes, when it is desired to keep the boards very light, oil is omitted; but the boards do not finish so well as when oil is employed.

The object of using fillers.

The composition of fillers.

For Light Wood.—Use one pint of boiled linseed-oil, one and a half quarts of turpentine, one pint of fine whiting or corn-starch (or half whiting or corn-starch and half flake-white may be used). If the wood has color, add enough color to make the starch or whiting the same shade as the wood. For oak use a little raw umber, not quite a teaspoonful if the oak is white, more if it is dark.

Rules for making the different wood colors.

For Dark Wood.—Use one quart of boiled linseed-oil, one quart of turpentine, one pint of whiting or corn-starch. For mahogany add one tablespoonful of burnt sienna, one fourth of a teaspoonful of yellow ocher, half a teaspoonful of Bismarck brown.

For Walnut.—One tablespoonful of burnt umber, half a teaspoonful of Venetian red, half a teaspoonful of yellow ocher.

For Ash.—One level tablespoonful of raw sienna.

These ingredients must be mixed very thoroughly, and a little be rubbed on a board to test the color; for the coloring-matter varies in strength, and it is impossible to give the exact proportions. In buying the colors get them in fine powder.

Test the colors before using on floor.

When the floors are stained with the powdered pigments combined with whiting and oil, the filling process is omitted in the first treatment.

When the filler is omitted.

Some of the close-grained woods in common use are bird's-eye maple, cherry, and sycamore; these, of course, do not require a filler. Among the open-grained woods are oak, mahogany, the pines, spruces, etc., and these should be treated with a filler.

Some woods which do not require a filler.

If there are large cracks in the floor, fill them with putty before filling and staining. If there is a great deal of this filling of cracks to be done, the putty may be made by mixing linseed-oil and sifted whiting together.

If the floor is dark, a little color could be worked in with the whiting.

The working of the whiting and oil together to make a smooth paste is quite laborious.

Removing previous coats of paint or varnish.

If the floor is old, or has been previously painted or varnished, all stains on paint or varnish must be removed before the filler is applied.

Use of ammonia, potash, quicklime, and washing-soda.

Strong liquid ammonia or a strong solution of potash or washing-soda will dissolve paint or varnish. If, at the same time, it is desired that the boards be white, quicklime is used in the wash. All these substances are severely caustic and destructive to hands and fabric; for this reason only worn-out garments should be put on, and the hands protected

by old thick gloves, while one is doing this work. Care must be exercised, when applying these caustic preparations, not to get a drop on walls, base-boards, doors, etc. Strong household ammonia should be employed. It may be poured from the bottle on paint or varnish. All the windows should be opened. In about half an hour after the caustic has been applied, the paint or varnish will be soft, and it may be scraped off. Wet the spot to be removed with hot water, and scrape gently; continue this until the whole floor has been gone over. From time to time take up the substance scraped from the floor. A smooth hoe may be used for the scraping. When all is done, wash the floor in several clean waters, and wipe dry. A self-wringing mop must be employed in washing the floor, as the caustic substance is injurious to the hands.

Self-wringing mop should be used.

The soda and potash are used in the same manner. If soda is used, it should be dissolved in boiling water in the proportion of six quarts of water to a pound of soda. To prepare potash, put a pound of the crystals in a wooden pail, and pour on them six quarts of cold water; stir until dissolved, and then apply. The chemical action that takes place during the union of the water and the potash raises the temperature so that the mixture becomes hot. If lime and soda are to be mixed, put the soda in a pail with about a pound of quicklime, and on this pour the cold water. The lime will slack immediately, and the soda will dissolve in the hot mixture. A combination of lime and potash is made in the same manner.

Soda and potash.

Mixing lime and soda.

To remove black or dark stains from the boards, pour a strong solution of oxalic acid on them, and they will disappear after a short time. Should the stain be very deep or old, it may be necessary to repeat the application of oxalic acid several times. The oxalic acid removes color and leaves the boards acid.

Using oxalic acid to remove stains.

When boards are to be colored by an alkaline substance, the cleaned spot must be neutralized by the application of liquid ammonia or soda before the staining-material is applied.

Neutralizing for an alkaline substance.

STAINING WITH CHEMICALS

There are several chemicals that may be used to darken wood, and this is the quickest and easiest method of staining the floor. These stains, however, do not have life or color, but they are soft and restful, and when oiled, waxed, or varnished make a satisfactory floor.

Characteristics of chemical stains.

A stain of potassium permanganate is made as follows: Mix together in a bowl cold water and potassium permanganate in the proportion of half a pound of the permanganate to four quarts of water. Let this stand several hours. Pour off the liquid into another bowl. More water may be added to the permanganate remaining in the first bowl. Apply this liquid to the boards with a brush. Close the room, and let the floor dry thoroughly. A few hours will do, but it would be better to let it stand for a day or two.

Potassium permanganate.

Rub the boards with a piece of clean carpet, and wax, oil, or varnish, as you may prefer. If a dark color is desired, double the quantity of potassium permanganate. When a very strong solution has been used the color is a purplish brown.

Put two pounds of potash in a bowl, and pour on it four quarts of cold water. Stir until the potash is dissolved. Apply this solution to the boards with a brush, being careful not to get any of it on yourself or surrounding objects. When this is dry, rub the boards, and finish in any way you wish. The potash solution does not darken the wood as much as the potassium permanganate; its effect is to make the wood look old.

Staining with potash.

Apply dilute nitric acid to the boards, allowing eight ounces of the acid to each quart of water, and proceed as in applying potassium permanganate.

Staining with nitric acid and household ammonia.

Apply household ammonia as in the preceding cases.

THE PREPARATION AND APPLICATION OF STAINS

Staining-liquids.

At any good paint-shop you can get, for a dollar and a quarter, a gallon of staining-liquid which will give you an imitation of almost any wood you want, or you can prepare your own stain. The method which I shall give for using the home-made stain applies also to the prepared article.

The method of applying the stain.

After filling the cracks in the floor with putty, see that there are no paint-spots on the boards. Should there be any, pour turpentine on them, and after a while scrape off the paint. Wipe all dust from the floor, then apply the stain with either a brush or a piece of cloth. I think, however, it gives a handsomer floor if you first rub in a little of the stain with the cloth. Color only a board or two at a time, moving the brush with the grain of the wood. When the floor is finished, close the room for twenty-four hours; four or five days will be better, if you can spare the room. At the end of this time, pin a piece of carpet on a weighted brush and rub the floor, one or two boards at a time, until smooth and glossy. After the whole floor has been treated in this manner, take the piece of carpet off the weighted brush, and replace it with a clean piece. Now polish the floor.

Leave room closed as long as possible.

How to varnish the floor.

The floor may be varnished. In that case it will never require polishing. Get the prepared varnish at a paint-shop, and put it on with a brush, being careful to draw the brush smoothly over the boards

and with the grain. Be careful to put the varnish on evenly, and to have only a thin coating. If you are going to varnish the floor, and do not own a weighted brush, you can get down on your knees and do the rubbing with an old piece of carpet, or rub with an old hair-brush covered with carpet.

SUMMARY

Summary of method of staining.

1. Fill cracks, if necessary.
2. Remove stains and every particle of dirt.
3. Rub boards smooth, and wipe up all dust.
4. Rub a little stain in with a piece of cloth.
5. Go over the floor again, applying the stain more generously, but not rubbing it in this time.
6. Let the floor dry for hours—days, if possible.
7. At the end of the drying-time, rub the floor with pieces of clean carpet or woolen cloths. This rubbing is to be done in the direction of the grain of the wood.
8. Apply finish or polish.

POINTS ON MIXING STAINS

Foundation of wood-stains. The foundation of nearly all kinds of wood-stain which amateurs use is a combination, chiefly, of boiled linseed-oil, turpentine, the earth pigments, and some aniline colors.

Pigments. The pigments may be bought in two forms—in a dry powder, or ground in oil; but better results may be obtained by using those ground in oil, although they are more expensive in this form than in the powder.

Points to be decided before beginning to stain. Before mixing the stain there are several things to be decided upon—the shade of color desired, the condition of the floor, and the extent of surface to be stained. If the floor is in good condition, any shade of stain may be applied; but if it is spotted and dark, the stain must be dark. One may have

a dark floor that at the same time is bright in tone. This is obtained by a generous use of the yellow and red pigments when mixing the stain. For example, a combination of burnt sienna, chrome-yellow, burnt umber, and Venetian red gives a dark floor, but one that has much warmth and life. One can follow definite rules to get special shades and colors, or one can work up a shade that shall harmonize with one's surroundings, and yet not be an imitation of any kind of wood. The following formulæ may be changed or modified at the will of the workman.

A dark stain which gives warmth and life.

STAINS MADE FROM COLORS GROUND IN OIL

Light Stain.—One pint of boiled linseed-oil, one pint of turpentine, one tablespoonful each of burnt umber and burnt sienna, and two tablespoonfuls of chrome-yellow (colors ground in oil). This gives a light stain suitable for pines and other light woods. It may be made several shades darker by adding an extra tablespoonful each of burnt umber and burnt sienna.

Walnut.—One pint of oil, one pint of turpentine, two tablespoonfuls of burnt umber, three of burnt sienna, two of chrome-yellow, and half a tablespoonful of lampblack.

Antique Oak.—One pint of oil, one pint of turpentine, two tablespoonfuls of burnt sienna, two tablespoonfuls of burnt umber, one tablespoonful of lampblack. Mix very thoroughly.

STAINS MADE FROM COLORS IN POWDER

Dark Mahogany.

1 pint of boiled oil.
1½ gills of turpentine.
3 tablespoonfuls of burnt sienna.

3 tablespoonfuls of whiting.
½ tablespoonful of yellow ocher or chrome-yellow.
½ tablespoonful of Bismarck brown.
½ teaspoonful of aniline black.

Light Mahogany.—Make the stain as above, omitting the black, and using less burnt sienna.

Cherry.

1 pint of boiled oil.
1½ gill of turpentine.
3 tablespoonfuls of burnt sienna.
2 tablespoonfuls of whiting.

Oak.

1 pint of boiled oil.
1½ gills of turpentine.
3 tablespoonfuls of raw umber.
3 tablespoonfuls of whiting.

Very Light Oak.—Make the same as above, using less umber and more whiting.

Antique Oak.—Add a little lampblack to the first mixture for oak.

Space allowed for in formulæ. The portions given in the formulæ are for about one hundred square feet.

TO GRADUATE THE STAINS

It often happens that one does not care to imitate a particular wood, but would like to get a soft medium shade. This is easily accomplished by adding burnt umber, burnt sienna, and chrome-yellow in small quantities to the light

hard-wood stain, and then testing on a piece of board until the required color is produced. I think this method gives the most satisfactory results. The colors used, ground in oil, cost from fifteen to twenty cents a pound, and may be purchased in pound boxes. Wood-stains to imitate any wood may be purchased in paste, about twenty-five cents a pound, and you may thin it yourself to the proper consistency, using equal parts of boiled oil and turpentine.

How to graduate color or shade in stain.

Cast of colors used in stains.

THINGS IMPORTANT TO REMEMBER

The longer a floor stands, after the stain is applied, before it is rubbed as a preparatory step for applying the polish, the handsomer it will be when polished. After the stain has been mixed, it should be tried on a piece of planed board. The softer woods, such as soft white pine, will take a deeper color than hard woods; if there are any sappy places in a board they will be darker than the smooth and hard parts. The strength in colors varies, and it may be that the proportions which are given will, with your colors, produce a lighter or darker effect.

Test stain before applying to floor.

GLUING FURNITURE AND OTHER ARTICLES

Certain conditions are necessary for success in gluing:

1. The surfaces to be glued together must be free from old glue, and from any particles of wood, dust, etc., that might tend to keep them apart.

2. The glue must not be too thick, nor spread on too thickly.

3. The two bodies must be fastened together very firmly until the glue has hardened.

Conditions necessary to successful gluing.

If all these conditions are fulfilled, there will be no trouble in gluing successfully.

Scrape all old glue from the surfaces to be joined. Have at hand some means of fastening the bodies together. Strong cords or bands of cloth may be used, where one has not a vise.

Method of gluing.

Apply a thin coat of glue to both surfaces, and bring them together, being careful to get them in the right position. Fasten them firmly, and let them stand forty-eight hours or more. Wipe off any glue that may have oozed out from the joining.

One can now purchase a good quality of liquid glue, which obviates the trouble and necessity of preparing a glue at home. If one prefers the latter, the manner of making it is comparatively simple, if one owns a glue-pot.

Preparing the glue if made at home.

Break the glue in small pieces, and cover it well with cold water. Let it soak several hours. Half fill the outer pot with water, and for every pint of water add one tablespoonful of salt; the water boils at a higher temperature when salt is added. Place the inner pot in this, and set over the fire, stirring occasionally. When the glue has melted, thin to the proper consistency with strong vinegar.

Heat only the amount required.

Glue loses strength by frequent heatings; therefore plan to heat only as much as will be required each time.

HOW TO MEND PLASTER CASTS AND PICTURE-FRAMES

Collect all the pieces, and place the cast where you can work with ease. It is well to have the cast, if small, on a board on which it may be lifted when putting it away. This will obviate the necessity of handling after the cast is mended.

Put a little white of egg in a saucer; stir into this enough fine whiting to make a smooth, thin paste. Wet the broken parts with this, and press them together gently but firmly.

When all is done, wipe off any particles of the paste that show. If bits of the cast are lost, fill in with the paste, and spread a little very thin and newly prepared paste over this to give the desired finish.

If there is a great deal of work to be done, prepare the paste several times; it will dry and become rough if it stands any length of time.

White-and-gilt picture-frames may be mended in the same manner. If the gilt part is lost, the repaired portion may be covered with gold-leaf, or, if the frame is a cheap one, it may be touched with the liquid preparation.

TO CLEAN PLASTER CASTS

To clean plaster casts, cover them with fine dry whiting and fullers' earth. Wrap them in a cloth, and let them stand a few days; then gently brush off the cleaning-material. This will not always give a spotless cast, but it is the safest method. If a wet substance is applied to them there is danger of removing the thin coating, often changing the whole expression of a beautiful cast. The better way is to have some sort of finish put on at the molder's, or one can do this at home.

TO WAX AND STAIN CASTS

Put a piece of common yellow wax, about the size of a large English walnut, in a cup or bowl. Place the cup in a pan with a little hot water, and put over a moderate heat until the wax is melted; then take the pan from the fire, and beat one gill of turpentine into the melted wax. With a soft brush apply the mixture lightly to the cast. When dry, rub down with a clean cloth until a good polish is obtained. Apply the wax again, dry, and polish. Continue this until the desired shade is obtained. If shadows and a

dark background are desired, add to the preparation left the tiniest bit of raw umber, emerald-green, or blue. Brush the places to be darkened with this and rub as before.

From time to time polish with an old kid glove. Great care must be taken not to get the cast too dark; this is apt to be a fault of an amateur.

Or the cast may be oiled with boiled linseed-oil, and then polished as when waxed. If color is desired, it may be added to the oil.

If a cream color only is desired, use white wax and refined turpentine.

CARE OF SMALL MARBLES AND ALABASTER

Make a strong suds with tepid water and soap. To each gallon add a tablespoonful of liquid soda. Wash the marbles in this, using a soft brush or cloth. Rinse quickly and thoroughly. When dry, polish with a soft cloth.

TO CLEAN BRONZES

Dust the bronze, then rub with a cloth slightly moistened with sweet-oil. Rub dry with a clean, soft cloth, then polish with an old kid glove or chamois-skin.

TO POLISH THE BRASS TRIMMINGS OF FURNITURE

Mix together one gill of paraffin-oil, half a gill of naphtha, and enough finely powdered tripoli to make a soft paste. Polish the brass with this, using felt, as in polishing woods. Next dust with dry tripoli, and polish with a soft linen cloth.

In polishing the brass ornaments or trimmings in furniture, it is desirable to use an application that will be as beneficial to the wood as to the brass. This is the case with the above mixture.

SOME USES OF LIME-WATER

Lime-water is made with quicklime and cold water. Put a lump of lime in an earthen bowl, and half fill it with cold water; stir with a stick or wooden spoon until the lime is dissolved. If it is very thick, add cold water to thin it. Let this rest for two hours, and then pour off the clear liquid, being careful not to take any of the sediment. Bottle, and keep for use.

On burns. For burns, mix one gill of the lime-water with one gill of sweet-oil, bottle, and keep in the kitchen.

To remove alkaline stains on white boards. If soda has been used on white boards to take out grease, the spot will become dark. Pour lime-water on this, and let it rest for half an hour or more, then wipe. The board will have its original white color.

As an anti-acid. It is an anti-acid tonic, and is used with a milk diet when the milk disagrees with the patient. A tablespoonful to half a pint of milk is about the usual dose.

For testing the air of a room. To test the purity of the air of a room, half fill a glass with lime-water. If there is an excess of carbonic acid in the atmosphere, a thin white scum forms on the surface of the water. **For softening hard water.** Lime-water can be used to soften hard water. (See "Water—Temporary Hardness.") Use one quart to ten of hard water.

CHLORIDE OF LIME

This is a good bleacher and disinfectant also. When it is to be used on fabrics for either purpose, dissolve one eighth of a pound in two gallons of cold water, stir with a stick for a few minutes to break up the particles of lime, then let the mixture settle, and pour off the clear liquid for

use. The sediment will be useful in drains or on the soil. This preparation should not be made in metal.

Used as a disinfectant. In infectious diseases a pound of this material will be of great use, if put in saucers and distributed about the bathroom, halls, and sick-room. It is very caustic, and should not be handled carelessly.

LIQUID SODA

Put one pound of sal-soda and one quart of water in a saucepan and on the fire. The soda will have dissolved by the time the water boils. Let this cool, and put it in bottles for future use; label the bottles, "Liquid Soda." This is a convenient form in which to have sal-soda. A tablespoonful of it added to the water in which clothes are boiled helps to whiten them, without the danger of injury that comes from using the crystals. When kitchen towels are boiled a little should be added to the water. Utensils in which food that leaves an odor has been cooked may be made sweet by boiling them for fifteen or twenty minutes in two quarts of water and a tablespoonful of the liquid soda. In fact, whenever one wishes to use washing-soda, the liquid article is ready. Soda is useful for cleaning tin and iron, for cleansing and sweetening the sink and all vessels that are not painted or varnished.

It is the abuse of such agents that makes one hesitate to recommend them. It must be remembered that sal-soda is very caustic, and will destroy all fabrics unless much diluted. It will destroy paint and varnish, and also color.

JAVELLE WATER

This water can be purchased at the druggist's, but one can prepare it quickly at home, if liquid soda is kept on hand. Dissolve a quarter of a pound of chloride of lime in

one quart of water; let it settle, and pour off the clear liquid; add to this one pint of liquid soda. For light stains this may be diluted with its own volume of cold water.

Javelle water loses its strength in being exposed to light and air; it should be kept well corked and away from the light. It is better to make only a small quantity at a time. This preparation removes color, and must be used only on white fabrics.

CARBOLIC ACID

This is a most valuable substance in the household. The best form in which it may be purchased is in the white crystals, put in a bottle with a glass stopper.

To make a solution of any strength, dissolve the crystals and add clear water. Keep another bottle for the solution.

When you wish to dissolve the crystals, place several folds of paper or cloth on the bottom of a small saucepan, and put the bottle on this. Fill the pan with cold water, and place it over the fire. Have a gill of cold water in a second bottle, and pour into this about two tablespoonfuls of the liquid carbolic. This gives a solution of about twenty-five-per-cent. strength, which may be diluted at pleasure. This bottle should be plainly labeled, "Carbolic Acid—Poison."

For sore throat, make a gargle with a half-pint of water and a teaspoonful of the solution. The same strength may be used to bathe stings of insects.

Bedroom floors or carpets wiped with a cloth wrung out of four quarts of water, to which have been added two tablespoonfuls of the solution, may be kept in a sweet and healthy condition. Plants may be freed from insects by spraying them with a weak solution of carbolic acid—one tablespoonful of the solution to a gallon of water.

In sickness, plumbing, clothing, toilet articles, etc., may be disinfected by a proper use of the solution.

The odor of the freshly dissolved crystals is not so strong as that of the solution which one buys ordinarily.

SOLUTION OF OXALIC ACID

Put four ounces of the crystals in an eight-ounce bottle, and add half a pint of cold water. Shake well. This amount of water will not dissolve all the crystals, but for a strong solution there should always be some of the undissolved crystals in the bottle. Label plainly, "Oxalic Acid —Poison."

FURNITURE-CLEANER AND -POLISHER

Put into a quart bottle, in the order named:

1 gill of powdered rottenstone.
1 gill of cold-drawn linseed-oil.
1 gill of turpentine.
1 gill of naphtha.
1 gill of strong solution of oxalic acid.
½ gill of alcohol.
1 gill of cold water to which has been gradually added a tablespoonful of sulphuric acid.

Shake well the contents of the bottle, and it is ready for use. Keep well corked. Use this, as directed for rottenstone and oil, for cleaning and polishing dull and dirty surfaces. This preparation will remove white marks from oiled, varnished, or painted surfaces.

ENCAUSTIC NO. 1

To be used on furniture, floors, and marble.

One pound wax; one pint turpentine. Melt the wax over gentle heat in a water-bath. When quite soft, remove from

the fire and beat in the turpentine. If it is to be used on furniture, beat in one gill of alcohol. If for floors, and the finish is desired soft, add one gill of paraffin-oil and omit the alcohol.

ENCAUSTIC NO. 2

5 quarts boiling water.
4 ounces laundry soap.
2 ounces sal-soda.
1 pound wax.

Cut soap and wax fine, and put them in the water, and place on the range. Stir frequently until dissolved, then add soda, and take from the fire. Stir almost constantly until cool, then put in a vessel that can be covered closely. This polish may be used for floors, marbles, tiles, and bricks. It will remove ink from varnished surfaces. When heated and diluted with its own volume of turpentine, it may be used for cleaning and polishing varnished or waxed surfaces, tiles, marbles, etc.

WAX FOR POLISHING FURNITURE

Break up one pound of wax, and melt it to the consistency of thick cream, in a bowl which is placed in a saucepan of boiling water. Take the bowl from the fire, and gradually beat into the wax one pint of turpentine and half a pint of alcohol. Put this away in covered jars; warm slightly when it is to be used. Spread the thinnest layer possible on a soft woolen cloth, and apply to the surface to be polished.

MATERIALS FOR CARE OF FURNITURE AND FLOORS

In the regular care of the interior finish and the furniture the following materials will be found valuable. The pow-

ders should be kept in small glass or wooden boxes, and labeled; they may then be kept in one shallow box, with the other materials. The cost of the outfit is slight, but the convenience of having these things at hand when required is great.

1 ounce burnt umber.	1 ounce raw umber.
1 ounce burnt sienna.	1 ounce raw sienna.
1 ounce yellow ocher.	1 ounce Bismarck brown.
1 ounce aniline black.	Whiting.
Turpentine.	Alcohol.
Shellac.	Paraffin-oil.
Boiled linseed-oil.	Powdered rottenstone.
Prepared wax (encaustic).	Woolen cloths.
Fine sandpaper.	Steel wool, fine and coarse.
Felt.	Powdered tripoli.

Powdered pumice-stone.

FULLERS' EARTH

This cleansing agent may be purchased at the druggist's. It is a soft, light-brown marl, and not expensive. It is a most useful article in the household. It does not injure the material on which it is used, is not poisonous, and it does not give off inflammable gases. The processes of cleaning fabrics with it are longer than when the volatile agents are used, but when an absorbent of grease is required it is most satisfactory. It can be bought in fine powder, as can also French chalk.

TO CLEAN WITH FULLERS' EARTH

Moisten the earth with cold water; lay the article on a clean table, and spread a thin layer of the paste over the soiled places. Hang the garment in a dry place for one or

two days, then brush off the dry earth. If there are grease-spots on the garment, the earth that is applied to them should be made quite wet with turpentine. Brush and press the garment.

TO MAKE SCOURING-BALLS

Make a strong suds of white Castile soap; pour enough of this on half a pound of fullers' earth to make a fairly stiff paste. Work this into smooth balls about the size of a small egg, and let them dry.

These balls are sometimes made with a mixture of fullers' earth, ox-gall, soap, and turpentine. They clean heavy and much-soiled goods more readily than do those made with the Castile soap-suds and the earth, but they cannot be used on delicate colors. It will be very little trouble to prepare both kinds.

The scouring-balls may be used in cleaning spots on carpets.

TO CLEAN WITH SCOURING-BALLS

Shake all loose dust from the article to be cleaned. Spread it on a clean table or board. Sponge the soiled places lightly with a cloth dipped in tepid water. Go over the soiled fabric with the scouring-ball, rubbing gently and thoroughly every part of it. When all the soiled surface has been treated, hang the garment in a dry place for a day or two, then brush the parts treated; they will be found perfectly clean. As this treatment removes all the surface dirt, the cleansed places will be of a little lighter shade than those which have not been treated. It may be necessary to press the garment if it was very dirty and required a thorough application of the scouring-ball.

HOW TO PUT NEW LININGS IN BOOTS AND SHOES

The kid or other linings in boots and shoes often become soiled or broken before the boots are half worn, and should be replaced by fresh ones. If the new linings are not properly fitted and pasted, they become a source of great discomfort. First cut an exact pattern of the sole of the boot. To do this, place the boot on a sheet of paper, and draw the outlines of the sole; then cut the pattern, which keep for future use. If kid is used, purchase, at a leather-store, one kid skin finished in white. Spread the skin on a board, finished side up, and lay the pattern on it, and with a pencil draw the outline. When you have drawn half the number of linings required, turn the pattern over and draw the other half; this will give you rights and lefts. Be careful, in outlining the soles, to place the pattern so as to give as little waste material as possible. Cut the leather with a sharp-pointed knife, following the pencil lines. One skin will make enough linings to last one person for years.

Make a paste with half a teaspoonful of flour mixed smooth with a tablespoonful of cold water. Pour on this enough boiling water to make a thin paste (about three tablespoonfuls). Tear the old linings out of the boot, then wipe thoroughly to be sure there are no particles of dust or lint adhering to the boot. Cover the wrong side of the lining with a thin layer of paste. Nearly double the lining, paste side in, and slip into the boot, unfolding it as it passes in place. See that it fits smoothly everywhere. Pass the hand gently over it, pressing lightly until the surface is perfectly smooth. Then go all over the surface with a piece of soft cloth, using a good deal of pressure. The boots should stand at least twelve hours to dry. If these directions are followed to the letter, the lining will fit and adhere perfectly.

TO CLEAN COMBS AND BRUSHES

Put enough water in a wash-bowl to reach the backs of the brushes, but not to flow over them. To each quart of water add one tablespoonful of borax. Free the brushes from dust, and place them, bristles down, in the water. Let them soak about ten minutes, then sop them up and down in the water until the bristles look clean. Rinse in plenty of clean cold water, and dry in a current of air.

Ammonia may be substituted for the borax; but as it softens the finish on the wooden backs of the brushes, it must be used with care.

Silver brushes may be immersed in the ammonia or borax water.

Heat and moisture dissolve the glue used to fasten the bristles to the back; therefore brushes of any kind should not be soaked for too long a time, and never in hot water. Never dry them in great heat.

Wash the combs in borax or ammonia water, rinse in cold water, and wipe dry. Combs should not be soaked or left wet.

TO CLEAN COAT COLLARS

Wet the soiled place with turpentine, and let it rest for ten or more minutes, then wet again. Scrape off the loosened dirt. Wet once more with the turpentine, and again scrape off the loose dirt. Continue this until all the dirt has been removed. In all the work let the scraping be very gentle, that the fabric may not be injured. Then sponge with a clean cloth and turpentine, and wipe until dry. The final sponging may be with alcohol or chloroform. These two substances evaporate quickly and leave a fresher-looking surface than when the cleaning is finished with turpentine.

AIDS IN DARNING LARGE HOLES

Baste a piece of thin net over the hole, and darn in the usual manner. The mesh of the net makes a groundwork for the threads. Old veils and bits of worn lace are well adapted for this work.

HOW TO REVIVE AND STRAIGHTEN WHALEBONE

Soak the bent bone in warm water until it is pliable; then press it with a warm iron.

TO PREVENT STAINS SHOWING THROUGH WHITEWASH OR PAPER

Before beginning to paper or whitewash, examine walls and ceiling, and if there are any dark spots, cover them with a coat of shellac.

TO PREVENT THE CORNERS OF RUGS FROM CURLING

Sew some stiff material like buckram or haircloth on the under side of the corners.

HOW TO HEAT INFLAMMABLE SUBSTANCES

An inflammable substance like alcohol, rum, turpentine, etc., should always be heated in a water-bath and watched carefully. Alcohol, rum, or whisky, when required for friction, should be put in a bottle. Place the bottle in a saucepan of cold water, and set on the range. By the time the water boils the liquid in the bottle will be hot. Keep th

bottle in the hot water while the liquid is being used. In heating turpentine, place the vessel which contains it in a pan of hot water. Watch this while on the fire, as it gives off inflammable gases. It is not often necessary to heat turpentine to a high temperature.

PRECAUTIONS TO BE TAKEN IN CLEANING

The pail in which the water for cleaning is put must always have a paper placed under it, whether it rest on floor, carpet, or other support.

Oil-bottles or other receptacles must be placed on several folds of paper or cloth, or on a plate or tray. Bottles in which there are acids, alcohol, or other cleaning substances, when in use, must always have paper placed under them.

Soaps must always rest in a dish of some kind.

Cleaning-cloths must not be dropped carelessly anywhere; they should, if wet, be placed on paper.

When using any caustic substance, like lye, washing-soda, ammonia, the greatest care must be exercised that not a drop is spilled on paint or varnish; and if such an accident should occur, immediately use plenty of water on the spot, or pour on oil.

If alcohol is spilled on varnish, wash with water immediately, or pour on oil. Be careful not to spill an acid on marble; but should this happen, pour on water, and wash off quickly.

In dusting or moving pictures, care should be used not to rub or handle roughly gilt frames. Oil-paintings must be dusted in the lightest and most careful manner, and should always be carefully covered before sweeping.

Be careful that all cloths and brushes are put away clean and dry, so that when needed they shall be in readiness.

Do not use strong acids or alkalis on the metals connected with plumbing.

FRAMES FOR DRESS-WAISTS AND MEN'S CLOTHING

Cut the hoops of a small barrel (the size known as half-barrels) in two parts. Wind folds of cambric or cotton on these, and fasten smoothly and firmly at the ends.

Tie a strong cord in the middle of each frame. Make a generous loop by which the frame can be hung on the hooks.

The advantages of these frames are that, while they support the garment perfectly, they are so free from sharp lines that they do not leave their impress upon it. Their cheapness and lightness make it possible to have as many as one may desire, and a few can be packed with ease for use when one is traveling.

CONVENIENT CLOTHES-RACK

When one is cramped for room, as is so often the case in a flat or boarding-house, a rack made to fit a curtained space, as an unused door, will be found invaluable. Have a planed board about five inches wide and the length of the space it

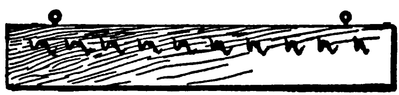

Fig. 52.

is to fill. Screw the desired number of hooks into this; on the top fasten two large screw-eyes (Fig. 52). Fasten two strong hooks in the wall or door, and hang the board, by the screw-eyes, on these.

The advantage of this rack is that it can be hung where one could not put in nails or hooks. It may be made so long that it will utilize all the space. The expense is almost nothing; the hooks and a piece of a dry-goods box will answer.

To protect the garments from dust, tack an old sheet over the wall before the rack is put up.

STEEL WOOL AND STEEL SHAVINGS

In European countries, where polished floors are the rule, steel shavings are used to clean off the floors when they become very much stained. In this country steel shavings or wool is used in rubbing down woodwork in interior finishes, but not much on floors. However, when properly used, this substance is a great aid in removing unsightly stains, or in making rough spots smooth. The American article is known as steel wool, and the imported article as steel shavings. The very coarse should be used on coarse floors, and the finer grade on fine floors. It may generally be found at painters' supply-shops.

INSECTS AND VERMIN

The housekeeper must always be on guard against the many enemies of foods, fabrics, materials, and personal comfort, which find entrance into the house in the form of insects and larger vermin. No place is exempt from these pests, but if one lives in a detached house it is a comparatively easy matter to keep it free from them. The dwellers in apartment and block houses are liable to invasion from the neighboring apartments. Water- and steam-pipes add to the ease with which water-bugs, cockroaches, etc., find their way through all parts of a building. Unscreened doors and windows admit flies, mosquitos, moths, etc. Rats and mice find their way into cellars and walls in the most unaccountable manner.

Absolute cleanliness and eternal vigilance are the price of freedom from these troublesome visitors. There are methods of exterminating all these plagues; but, when pos-

sible, the preventives should be employed. If, however, the housekeeper finds that any kind of vermin has found lodgment in her premises, she should use immediate and vigorous measures to exterminate them, using the cleanest, surest, and safest remedies that she is acquainted with. There are some manufactured articles on the market that will clean a house thoroughly of all insects, if used faithfully. The housekeeper may also employ successfully many substances with which she is familiar.

Naphtha, properly used, is one of the cleanest, easiest, and most effective remedies; but it must be used with intelligence and care. None but responsible, careful people should ever be allowed to employ this agent. The danger is from an inflammable gas which it gives off. If the work is done in a room where the windows are wide open, and there is neither light nor fire, there is not the slightest danger.

In attempting to exterminate any sort of insects by the use of naphtha, it must be remembered that the infested places must be saturated with the naphtha, and also that this only kills the living animal, not the eggs. After the first application of naphtha, wait three or four days, and saturate the places a second time; this will kill any life that may have developed from the eggs. When naphtha has been used in this manner, the windows of the room should be left open for several hours.

Water-bugs.—Pour a weak solution of turpentine into the pipes once a week for a few weeks, and the bugs will cease to make their visits. Use half a pint of turpentine to three pints of water. The turpentine will drive the bugs from their hiding-place, and they should be killed when they are seen. The remedies that will exterminate cockroaches will, as a rule, exterminate water-bugs also. The preparations that one buys for cockroaches are generally effective for water-bugs and ants.

Cockroaches.—One of the methods of drawing cockroaches into the house is to leave kitchen garbage standing about for hours. The greatest care should be exercised to destroy or remove all garbage as soon as the dishes are washed. Keep all food covered; keep all corners and crevices clean and dry. There are several methods of exterminating the roaches.

1. Blow insect-powder into all the cracks from which the pests come. In a few hours brush up the dead insects and powder, and burn them. Fill all cracks and holes with a second dose of powder. After a few hours brush up and burn powder and roaches. Then spread powdered borax about the cracks and holes.

2. Make a strong solution of carbolic acid,—two tablespoonfuls of the acid to a pint of water,—and force this solution into all the cracks and openings. The odor of the carbolic lasts for several days; one may, however, be comforted with the knowledge that nothing can be cleaner or more effective. It may require several applications of the solution.

3. Dissolve one pound of alum in three pints of hot water, and force the hot solution into the cracks and openings. Afterward spread borax about the places where the roaches have been in the habit of appearing.

Ants.—To exterminate ants, use the hot solution of alum or the carbolic solution as for cockroaches. Or pour oil of pennyroyal on a large piece of cotton-batting; tear this into small bits, and spread them about the places where the ants appear. The odor is very strong and lasting. With the removal of the cotton it soon disappears.

When the fresh pennyroyal can be procured, spread the leaves about the infested places.

Bedbugs.—1. The quickest, cleanest, and surest method of exterminating this pest is by the use of naphtha. Open all the windows in the room. Shake and examine all the

bedding. Hang out sheets, blankets, etc. Saturate the mattresses and pillows with naphtha, and put them out of doors, if possible. Brush the walls of the room, not leaving a particle of dust in crack, groove, or corner. Sweep the floor or carpet, if there is one. Take the bedstead apart, and lay the parts on the floor, the grooved sides up. Saturate all the joints and grooves with naphtha. Wet the carpet with the naphtha. If there are any cracks or breaks in walls or floor, fill them with naphtha. Then leave the room, locking the door, that no one may enter until all the gas has passed off. A few hours will answer, but where naphtha is used in large quantities, it is safer to keep the windows open and the door shut the greater part of the day.

This application of naphtha will kill all the living insects that it comes in contact with, but not the eggs. In three or four days repeat the operation, and there will be no more trouble, unless the insects are in the wall, where the naphtha cannot reach them.

Caution: Remember that there is great danger if fire or light is allowed in the room while the work is being done, or for hours after, while the inflammable gas is in the room. On the other hand, there is not a particle of danger if these directions are carefully followed. The advantage of the naphtha over all other remedies is that it is not injurious to any finish, fabric, or color. It leaves everything cleaner than at the beginning of the process. The work is quickly and easily done, and the odor passes off quickly.

2. Clean the room as for the naphtha process. If there is a carpet, remove the tacks, then blow insect-powder all over it. Fold it from both sides toward the middle, and powder the parts that are folded over. Fold both ends toward the middle, and powder again. Roll the carpet up, powdering the under part as it comes to the top. By following these directions, every part of the carpet will be covered with the

powder. Let the carpet lie rolled up in this manner for a day; then have it beaten and brushed.

Spray the mattress and pillows with the powder. Take the bedstead apart as for the naphtha process; wash it with a strong solution of carbolic acid, pouring the solution into the grooves and joints. Wash the base-boards and floor with the carbolic solution, spraying cracks and joints with it. Let the windows stand open all day. The odor of the carbolic will last for some time, but it is clean.

If there is a strong objection to the odor of carbolic, the insect-powder may be used instead. It may require two applications of either powder or carbolic. Old powder is not effective.

Examine the picture-moldings; they are generally made of the soft white woods in which these insects thrive.

Moths and Buffalo-bugs.—The naphtha treatment as for bedbugs will exterminate moths and buffalo-bugs. It must be remembered that all the eggs must be removed by brushing and shaking before the naphtha is applied; or, if not, treat the articles to a second dose of naphtha after three or four days.

Frequent thorough brushings, beatings, and airings will keep furnishings and garments free from these destructive insects.

If closets are washed in the spring and fall with a weak solution of carbolic acid, one may be reasonably sure that they will be free from insects.

Kill every moth-miller found flying in the house. Should you find the minutest colony of moths or buffalo-bugs in a piece of furniture or fabric, do not cast them to the four winds to prey upon your neighbors. Take the article into the laundry or a vacant room, and saturate it with naphtha; then put it out of doors, if you please; the moths will be beyond doing any further harm.

Flies and Mosquitos.—Of course, if good screens are on doors and windows there will be little trouble with either flies or mosquitos.

Open the windows. Put some insect-powder on an old plate; set fire to it, and place on an inverted tin pan in the middle of the room. Close the door. The smoke will drive the flies and mosquitos out of the room.

Rats and Mice.—If these vermin get into the house, the safest method of removing them is by the trap. Have all the holes filled in this manner: sprinkle chloride of lime in the hole, then fill in with broken glass, and finally seal with mortar or plaster of Paris. Bait the traps with meat; it is much more effective than cheese. If there must be delay in filling the holes, give them a generous dose of the chloride of lime.

THERMOMETERS IN THE KITCHEN

If it were possible to use the thermometer freely in all culinary operations, the science of cookery would be very much simplified; but there are many obstacles in the way. The ordinary thermometer is very fragile, and must be used with the greatest care, and in the various dishes which are being prepared at the same time it would be impossible to use the instrument freely. The glass is liable to break when exposed to extremes of temperature. Many attempts have been made to produce a satisfactory oven-thermometer, but, so far as I know, the only successful one is based on the principle of the expansion and contraction of metals. This thermometer has an indicator like the face and hands of a clock, and is fitted into an opening in the oven door. While this thermometer does not indicate the temperature to a nicety, like mercury, it is accurate enough for all practical purposes. The trouble with a mercury thermometer is that when exposed continuously to a high temperature the mercury does not fall back easily, and sometimes refuses to do

so at any temperature. A thermometer that is used in cooking should be incased in copper. They may be purchased or ordered at any chemical supply-store.

In using a thermometer great care is necessary to protect the bulb from cracking or breaking. Always heat and cool it gradually. A thermometer, when plunged into a hot liquid, or when taken from a hot bath and exposed to cold air, is liable to break. The bulb must never rest on the bottom of a stew-pan. Be careful not to hit or jar it. Immediately after using, it should be wiped dry and carefully put away.

THE MELTING-POINT OF SOME METALS AND ALLOYS

Many household utensils are often exposed to too high a temperature, because of ignorance of the melting-point of the metal or alloy from which they are made. With the exception of iron and steel, but few pure metals are used in the manufacture of household articles, the greater number of metal articles being made with alloys.

Many alloys melt at a much lower temperature than any one of the metals which enter into their combination. The following tables of the melting-point of a few of the metals and alloys will illustrate this fact.

	F.	
Copper	2000°	Temperature at which different metals melt.
Zinc	914°	
Antimony	810°	
Lead	612°	
Bismuth	476°	
Tin	442°	

1 part tin, 25 parts lead	558°	Temperature at which different alloys melt.
4 parts tin, 1 part lead	365°	
2 parts tin, 2 parts lead, 1 part bismuth	292°	
5 parts tin, 3 parts lead, 3 parts bismuth	202°	

Britannia is made from tin, copper, and antimony in varying proportions, depending upon the quality of the product. If we were to estimate the melting-point of this alloy by that of the metals that enter into its composition, we should place it high; but we all know by experience that the melting-point is very low, so we are careful not to expose utensils made from this metal to a temperature much above the boiling-point of water (212°).

In using utensils made from alloys of all kinds, the liability to melt at a low temperature must always be kept in mind, that the article may not be softened and gotten out of shape, or, worse still, injured beyond repair.

THE MELTING-POINT OF SOME FATS AND SUGAR

	F.
Olive-oil	75–76°
Cotton-seed oil	95.5°
Butter	91–94.8°
Kidney suet of most animals	101.6–130.8°
Lard	108.5–112.3°
Sugar	320–400°

When a bottle of olive-oil standing in a temperature of 75° or 76° looks a little thick or is flecked with undissolved particles, it is an indication that it has been adulterated with an oil that melts at a higher temperature.

When butter holds its shape at a temperature above 95°, it is an indication that it has been adulterated with some fat, like suet, that melts at a temperature above 95°.

When dry sugar is exposed to a temperature of 320° it begins to melt; when the temperature reaches 400° the sugar passes to the caramel stage, and from that to the dark, bitter substance known as burnt sugar.

BACTERIOLOGY

This wonderful science has developed so rapidly that it is almost impossible to realize that comparatively little was known about it twenty years ago. Through this science have been found means of preventing and arresting disease and decay in animal and vegetable life, and a knowledge of it is very important to the housekeeper, that she may protect her family and belongings against the ravages of the destructive bacteria. So many wild and absurd statements have been made by those who have only a superficial knowledge of the subject that the result has been to frighten some people and disgust others. There is no cause for either, and certainly it is criminal not to inform one's self on a subject that has such a power over our lives.

The amount of knowledge on the subject necessary for the housekeeper is not difficult to acquire. There are several books written upon it that come within the comprehension of the most unscientific mind. "The Story of Bacteria," by T. Mitchell Prudden, and "The Story of Germ Life," by Professor H. W. Conn, are small books written in such a simple, clear style that they are within the understanding of a child, and no housekeeper should fail to include them in her library. The information they contain is presented in such an attractive form that it should mean, in the future, better conditions for the health and happiness of the home. "The Principles of Bacteriology," by A. C. Abbott, is also a useful book for those desiring to study more of the subject. A book which is intended for the farm and dairy, "The Principles of Modern Dairy Practice," by Gösta Grotenfelt, translated by F. W. Woll, is full of information for the housekeeper. It is very clearly and simply written, and is a most interesting book.

A few things which the housekeeper should keep in mind,

in regard to bacteria, is that they are of the lowest form of vegetable life, and so small that they can only be seen under a strong microscope (hence the name microbes); that they multiply rapidly under proper conditions, dirt, warmth, and moisture being the most favorable, and that only a very high or very low temperature, or certain disinfectants, can kill them.

From the foregoing will be seen the necessity for thorough cleanliness, ventilation, light, and sunshine.

HOUSEHOLD ACCOUNTS, AND THE DIVISION OF THE INCOME

There is no greater aid to economy than a regular system of keeping accounts, and a proper division of the income. The housekeeper who is careless in these matters does a great injustice to herself and her family. When a woman knows how much money she may have to spend each month, if she is an honest woman she will not exceed that sum, except under very unusual circumstances. If she keeps her household accounts regularly she will see where every cent goes, and if she has made a mistake one month she will not repeat it the next.

Cash-accounts are the best. There is nothing more deceptive or extravagant than running bills at the various shops. It generally means an expenditure of at least one third more than when you pay cash. This does not mean that you are charged for more than you purchased, but that you ordered more carelessly than if you made cash payments.

The system of keeping accounts should be so simple and clear that it need not be a burden. There are on the market several kinds of housekeeping-expense books, which are very good.

The question of the division of the income is one that perplexes a great number of people, and yet I do not see how it is possible to make a general rule that shall cover

any great percentage of the families of this country. Locality, education, and manner of living all must be taken into consideration, rents in large cities being at least three times as much as the same kinds of houses would cost in the country. Much of the food and fuel in the country cost much less than in the city. If one lives some distance from the business center in the city, car-fares are quite an item. Shelter, food, fuel, and clothing are four items of expense common to all classes, and they are imperative. The number of other expenses increase or diminish with the mode of life. No matter how simple or elaborate the style of living, each housekeeper should make up her mind that the expenses shall not exceed the income. To do this there must be a well-defined plan of expenditure.

Here is a simple and good system. Have a set of envelops marked thus:

Rent.	Groceries.
Fuel.	Milk.
Light.	Butter.
Service.	Eggs.
Butcher.	Replenishing.
Vegetables and Fruit.	Incidentals.

Have a slip of paper to put in each envelop, on which may be jotted down any item you may wish. Then decide how much can go into each envelop for the weekly or monthly expenses, as the case may be. Put that amount of money in each envelop, and on no consideration spend more than that sum. If at the end of the month you are so fortunate as not to have spent all you put aside for expenses, put this surplus with your savings. This system will insure your keeping within your means, at least, and is, of course, intended for persons with limited incomes.

Each month there should be something saved for sickness

or reverses, which are sure to come sooner or later. Even a dollar a month will count for a good deal at the end of a few years. If there must be great economy, let it be in simplicity of living and dress. Do not reduce the food to the smallest amount possible for existence. Let it be simple, but well cooked, and enough of it. It is impossible to have physical, mental, or moral energy on improper or insufficient food.

Economies in the home should mean, above all things, that the most precious thing in it—the mother—shall not be misused or wasted. She should not be burdened with the problem of living in a style beyond her means, with the result of narrowing her life and dwarfing her nature. How much better to live simply and honestly, growing broader, sweeter, and happier with each year of such home life! And the children who grow in such an honest atmosphere must, as a consequence, be better men and women than if their young lives had been poisoned with the struggle to live in a style which the family income does not warrant.

CHAPTER XVII

SUPPLEMENTARY

TO CLEAN TARNISHED NICKEL ON STOVES

Make a paste of powdered pumice-stone and sweet or paraffine oil. Rub the nickel with this. Polish with a soft cloth. Any nickel finish may be polished in the same manner.

TO KEEP THE RANGE CLEAN AND BLACK

Once or twice a week wash the range with soap and water and rub dry. Put on a *very thin* coat of blacking and when nearly dry polish with a stiff, dry brush. If the top of the range becomes red and the blacking refuses to stick to it, when cold rub a light coating of lard over it and let stand for several hours, then black and polish in the usual manner.

TO CLEAN WROUGHT IRON

Make a woolen cloth damp with sweet oil. Rub the wrought iron with this, then polish with a dry, woolen cloth.

BRASS CLEANER

Mix together four ounces of rotten-stone, three ounces of

paraffine or sweet oil, two tablespoonfuls of a solution of oxalic acid, and one pint of water. Beat until smooth, then bottle.

BEAN WATER FOR CLEANING BRASS

Water in which dried beans have been boiled will clean brass articles quickly and easily. Put the articles to be cleaned in a kettle and cover with strained, hot bean water. Boil ten minutes, then rinse quickly in clear, hot water. Rub dry with a soft cloth. The articles must be entirely covered with the bean water. This method is particularly good for small articles like candle sticks, lamp burners, etc.

STAINS FROM MARBLE, ENAMEL AND PORCELAIN

Brown stains that come on bath tubs, basins, etc., may be removed with powdered pumice-stone. Wet a cloth with soap suds. Put a little powdered pumice-stone on the cloth and rub the stained spot and the stain will disappear in an instant.

HARD OIL FROM WINDOW GLASS

This stain resists almost every agent except powdered pumice-stone, which removes it readily.

TO REMOVE PAINT OR VARNISH FROM WINDOW GLASS

Wet the paint spots with turpentine, liquid ammonia, or liquid soda. Repeat the wetting until the paint or varnish begins to soften. Now scrape gently with a piece of soft wood or a copper cent, then rub with a piece of paper wet with the cleaning fluid. Be careful not to get the soda or ammonia on the paint or varnish of the window frame.

GLUE ON FABRICS OR FURNITURE

Vinegar is a solvent for all fish glue. When gluing a piece of wood work, if any particles of glue get on places where it is not desired, wet a bit of cloth with vinegar and rub it off. If glue gets on clothing or other fabrics sponge with a cloth wet with vinegar. To soften old glue on woodwork or fabrics wet with vinegar and when softened wipe off with cloths wet with vinegar.

HOW TO TREAT A SOAPSTONE GRIDDLE

A soapstone griddle can be used without greasing. Scour it thoroughly with pumice-stone and soap and water and you will have no trouble.

PASTE FOR CLEANING SILVER

Dissolve one ounce of powdered borax in half a pint of boiling water; when the liquid is cold pour it on four ounces of precipitated chalk and beat until smooth. Add one gill of alcohol, and bottle. Shake well before using.

RUST ON GAS STOVES

Rust on the oven and broiler of a gas stove is caused by the steam from the food, which condenses on the metal as it cools. About once in ten days or two weeks rub the entire surface of the baking and broiling ovens with a cloth wet with kerosene. Do this at night, and by morning nearly all the odor will have disappeared. The heat will drive off what little remains.

TO CLEAN STAINED ENAMELED UTENSILS

You can keep your enameled ware almost as fresh and bright as new by the use of soda. If a saucepan becomes

discolored or burned do not scrape with a knife or any hard substance which would scratch or break the enamel. Fill the saucepan with water and place on the range. Add a tablespoonful of sal-soda for every quart of water. Let the saucepan remain on the back of the range nearly a day. The hot soda-water can be poured into the sink or it may be bottled for use again.

RUST ON NICKEL PLATE

Cover the rust spots with mutton fat and let it remain a few days, then rub with powdered rotten-stone or tripoli and oil. Give the final polish with whiting and oil.

TO REMOVE FLY SPECKS FROM GILT FRAMES, ETC.

Dissolve one ounce of pure borax in a pint of boiling water. When cold sponge the soiled places with the liquid. Use only enough moisture to wet the spots. Repeat this several times, and then rub gently with a soft cloth made damp with the solution of borax.

TO CLEAN AN OIL PAINTING

Fold a soft cloth and wring out of tepid water. Spread the wet cloth over the picture and let it rest for about half an hour. Remove the wet cloth and wipe the picture with a soft, damp cloth, then with a soft, dry cloth. This will generally remove all fly specks and dust.

TO CLEAN GLASS BOTTLES

By any one of the following methods: Crush some egg-shells and put them into the bottles with hot suds; shake vigorously, turn out the suds and rinse with cold water. Another way consists of dissolving a tablespoonful of wash-

ing soda in a pint of water, and, when the mixture has partially cooled, pouring it into the bottles; then tearing some soft paper into bits and putting them into the bottles to stand an hour or more, and finally shaking vigorously, emptying and rinsing in cold water. A third method is to cut up raw potatoes, put them into the bottles with cold water and let rest for a few days; then shake well, empty and rinse. To clean the bottles quickly put about a gill of water and two tablespoonfuls of household ammonia into them, and, after shaking well and emptying, rinse with clean water. Here is still another way: Put a gill of cold water into a bottle, then pour in, very slowly, about two tablespoonfuls of sulphuric acid. This will make the water hot; let this stand a while, then shake well, empty, and rinse. The bottles may be cleaned more quickly by this process than by the other methods. The acid will also remove stains when soap and water will not. Carafes, either of cut or pressed glass, may be cleaned in the same way.

TO CLEAN HAIR BRUSHES

Hair brushes may be cleaned with borax, ammonia or soda; borax is possibly the best. Dissolve the borax in boiling water and add cold water to the liquid. Allow one tablespoonful of borax to one quart of water. Have the brushes free from dust and put them in a washbowl with enough of the borax water to cover the bristles. Soak ten minutes, then sop well in the water, being careful not to wet the tops of the brushes. Rinse in plenty of cold water and dry in a current of air. Do not have the water hot and do not dry in the heat.

TO REMOVE RUST FROM MATTING

Rust Stains on matting may be removed in this manner: Have ready some muriatic acid, a hot iron, dry cloths, an

old nail-brush, a sponge, a bowlful of boiling water and two pailfuls of clean cold water. Cover the spot with paper and place the hot iron on this. When the matting is hot dip a glass rod or stick in the acid and touch the stain; it will instantly turn to a bright yellow. Wash quickly with the boiling water, using the nail brush; then with the clear water, using the sponge; wipe dry. The work must be done quickly and all the acid removed from the matting by repeated sponging with clean water. I always, when possible, heat the stain, as the acid acts more quickly on a hot than on a cold substance.

TO ERADICATE INK STAINS

Yes, there are chemicals that will remove stains made by nearly all kinds of writing-ink. I am rather reluctant to give this process because the average person is not careful to follow directions, and it is important in this case that the directions should be followed exactly. I have used the process successfully on paper, books, white goods, carpets, and on the green felt of my writing-desk. The chemicals are apt to change or remove the colors in colored cotton goods. Here is the rule: Dissolve four ounces of bicarbonate of soda in half a pint of boiling water; add an ounce of chloride of lime; stir until nearly all the lime is dissolved, then cover and let the liquid settle. Strain through cheesecloth into a bottle. This is Javelle water. Cork tight and keep in a box, as exposure to light is injurious to it.

Get at a druggist's two glass stirring-rods, and four ounces of acetic acid.

When you wish to remove an ink stain, put on the table a large plate, the glass stirring-rods, and a small quantity of each chemical in two separate bottles. Spread the stain on the plate; dip a glass rod in the acetic acid and rub the stain gently until moistened. Dip the other rod in the

Javelle water and rub on the stain. Wait a few seconds and repeat the application of Javelle water if the stain does not disappear. When the ink is removed go over the spot with the rod wet with acetic acid. This is to neutralize the Javelle water. I should rinse wash goods in clear water.

You can purchase the Javelle water at a druggist's, or you can buy for twenty-five cents a small, ink-eradicating outfit. It is virtually what I have given here.

CEMENTS FOR MENDING CHINA AND CROCKERY

Expensive articles are sometimes mended by riveting the pieces together, but it is difficult to get a cement that will resist long exposure to water. Articles that are mended with pure white lead, or with a mixture of powdered asbestos and water-glass, will hold together if washed with care—that is, washed and wiped quickly. Articles mended in this manner will not bear soaking in water. Rub a thin coat of the best white lead on the broken edges, then press together and tie in position with bands of cloth. Keep the articles in a dry place for six weeks before using.

ASBESTOS AND SILICATE OF SODA

Mix together enough powdered asbestos and silicate of soda (liquid glass) to make a thick paste. Put a thin coating of this on the broken edges of the article to be mended, and press together. The parts must be held together firmly for at least an hour. When possible use a rubber band.

TO PREPARE WHITEWASHED OR CALCIMINED WALLS FOR PAPERING

Brush the walls with weak vinegar and when dry brush off the loose lime.

POUNDING IN WATER-PIPES

The pounding so frequently heard in the kitchen boiler and pipes, as a rule, comes from one of two causes. The water is raised to so high a temperature that some of it is changed to steam. All that is necessary in this case is to open the faucets and let water and steam pass off. The second cause, and one which is not so frequent, is an accumulation of dirt in the pipes of the water-back. In this case all that is necessary is for the plumber to disconnect the pipes and blow the dirt out.

WHEN IT IS NECESSARY TO BOIL DRINKING WATER

The following is a physician's rule for boiling and aërating drinking-water. Boil the water for fifteen or twenty minutes, then pour it into a stone jar and cover it with a piece of cheese-cloth. Let it stand in a cool place for twelve or more hours, then put it into beer bottles having patent stoppers, and place on the cellar floor or in the refrigerator. Water prepared in this manner is bright and palatable. The stone jar, bottles and cheese-cloth must be thoroughly washed, scalded and dried each time they are used.

METHODS OF CLEANING LACE

"How shall I clean my lace," is a question that is frequently asked. In answer to these constant inquiries, here are some methods that I have used successfully. It must be remembered that no matter what the process of cleaning may be, three things are necessary to success: care, patience and time. With these three things a good lace may be made to look as well as when new. While it would not pay one to follow the same method with common as

with fine laces, still it always pays to do a thing properly. The reader will use her own judgment in selecting the method for her special kind of lace.

FRENCH METHOD OF CLEANING FINE LACE

Make a strong suds of castile or any pure white soap. Let it be hardly tepid. Let the lace soak in this a few hours. If possible let the dish stand in the sun. Sop and squeeze it in the hands until the dirt starts from the lace. Now put it into the second suds and treat in the same way, and then again into a third suds. The handling must be done very carefully and gently. Next rinse in clear water. Examine and see if it is perfectly clean. and let it stand in clear water until you are ready to spread it on your board. Have the board covered with a clean piece of white flannel. It wants to be stretched perfectly smooth and tight. If the piece of lace is very long, of course you will require a long board or table. The flannel better be tacked on the board to make it perfectly smooth and tight. Now squeeze the water from the lace, and put it through a water with very little bluing.

If you want to get the old gray look that the point laces usually have, add to this bluing water a drop or two of black ink. Be careful not to get too much, only a suggestion. Try a piece of some white fabric in it before you put the lace in. Now squeeze the lace from this, spread on your board, and with a long pin or needle pick out every point or loop, fastening each point with a small pin. Just press the pin through into the board to hold it. Let it dry in the sun. If you would like a little stiffening in the lace, make the thinnest kind of starch, using a teaspoonful of dry starch to a quart of water. While this is still boiling add half a teaspoonful of white gum arabic which has been soaked in two or three tablespoonfuls of cold water for a few hours.

Strain this, put a little in a saucer. Have two clean sponges. Dip one into the starch. Be sure not to have enough of the starch to drop from it, pass lightly over the lace and wipe at once with the dry sponge, so that the starch may not pass through to the flannel. Do only a little bit at a time and let dry again in the sun, and when dry take off carefully and fold or roll as you may think best.

WASHING FINE LACES

Have a strip of flannel, on which baste the lace, using care to have every point basted down smoothly. Make a strong suds of white soap and water, Dissolve one teaspoonful of borax in half a pint of boiling water, and add it to two quarts of the suds. When this liquid is tepid lay the lace in it and let it soak for ten hours or more. Then sop and squeeze the flannel, but do the work carefully and gently; then squeeze out all the suds and drop the flannel in a bowl of hot suds. Work gently in this water. Now rinse in fresh water until the water looks clear. Finally starch and squeeze as dry as possible. Tack the flannel on a clean board, drawing it very tight in all directions. See that every part of the lace lies smooth and that all the meshes are open. When dry cut the basting threads and draw them out very gently. The lace may be tinted in the last rinsing water if the dead white is not liked. If the lace is point or any of the laces with raised designs, it will be necessary to lift the raised work with a small pointed instrument; a toothpick may be used.

CLEANING COMMON LACES

Make the suds as for fine laces and let the lace soak in this for ten hours or more; then rub gently between the palms of the hands. Wash in a second suds in the same

manner, then rinse until the water is clear. If the lace is to be tinted, do it now, then starch. Have a flannel tacked tightly on a board; spread the lace on this and pin to the flannel. Be sure that the lace is drawn out properly and that each point is fastened to the flannel with a pin. Or, the wet lace may be drawn out perfectly smooth, covered with a piece of cheesecloth, and ironed with a moderately hot iron until quite dry.

STARCH FOR LACES

Mix one teaspoonful of starch with two tablespoonfuls of cold water and pour on this one pint of boiling water. Place on the fire and add one fourth of a teaspoonful of sugar, and one fourth of a teaspoonful of gum-arabic which has been soaked in one tablespoonful of cold water. Boil for five minutes, stirring all the while. Strain through cheesecloth. For laces in which only a suggestion of starch is required double the quantity of water. For heavy laces that are required to be rather stiff use only half the quantity of water.

GUM-ARABIC STARCH

Gum-arabic starch is made by putting one fourth of an ounce of the best white gum-arabic in a cup or wide-mouthed bottle with one gill of cold water. Let it soak for two or three hours, then place in a basin of cold water and put on the fire to dissolve. Stir frequently; strain through cheesecloth. This makes a very stiff starch. For articles that need to be only slightly stiffened a quart of water or even more may be added to the dissolved gum-arabic.

TINTING LACE

To give thread lace a soft, old look pass it through water that has been slightly blued and to which has been added a

little black ink—one drop of ink for every half pint of water. For an écru tint use tea, coffee or saffron. Make the tinting fluid fairly strong and try a corner of the lace in it; if too strong add water. To my mind, tea is the most satisfactory agent, but it does not give as yellow a tint as coffee or saffron.

CLEANING LACES WITH GASOLINE OR NAPHTHA

Put the laces in a bowl and cover with naphtha. Let them soak for an hour, then wash by sopping and rubbing between the palms of the hands. Rinse the lace in a second bowl of naphtha, then pull it into shape. The texture of the lace is not changed in the least by this method of cleaning. If you want to stiffen it dip it in a thin solution of gum-arabic, pin it to a covered board and let it dry. There must be neither fire nor light in the room when the lace is being washed with the naphtha, and the windows must be open

CLEANING LACE WITH ABSORBENTS

Mix together equal quantities of cream of tartar, magnesia and powdered French chalk. Spread the lace on a piece of cloth and sprinkle it thickly with the mixture and roll up. Let the lace lie in this for a week or ten days, then shake off the cleaning mixture. With a soft clean cloth wipe the lace. This method will only answer for laces that are not much soiled.

TO REMOVE YELLOW SPOTS FROM OLD LACES

Wet the lace and spread it where it will freeze. Or make very wet and spread it in the hot sun. In either case the lace may require several days to bleach and it must be kept wet all the time.

GRASS STAINS

When all other remedies fail, grass and other green stains may be removed with grease. Rub lard on the stain, then wash with soap and cold water. Finish washing in the usual manner.

PEACH STAINS

When boiling water will not remove peach stains soak the stain in a solution of oxalic acid for five minutes, then rinse thoroughly in several clear waters. Hang the article out of doors in the sun and the stain will disappear in an hour or two. This treatment is only for white wash-goods.

BLUE STAINS FROM BLUING, ETC.

Wash the stain with alcohol and it will disappear.

EASY METHOD OF REMOVING SPOTS FROM GARMENTS

With the aid of a small nail or tooth brush nearly all kinds of spots may be removed with ease from garments, etc.

Put some folded cheesecloth under the stain. Wet the brush in the cleaning substance and rub the stain gently with it. Repeat until the spot is clean, then pat the spot with some dry cheesecloth. Take up on the brush only a little liquid at a time. On wash-goods for ordinary dirt use clear, cold water at first, then follow with white soap and hot water For oil or grease of any kind use *cold* water and soap at first. Finish. if necessary, with hot water. On goods that are not washable use naphtha, gasoline, or fresh,

clear turpentine. For delicate colors use chloroform or ether. For other methods see stains on fabrics, page 300.

DO NOT USE STRONG ALKALIES IN LAUNDERING WOOLENS

Alkalies, like soda and potash, even when very dilute, have a tendency to dissolve, and gelatinize wool fiber and should not be employed in washing woolens. Ammonia softens and cleanses wool, but it is better for colored than white garments, as it has a tendency to make white flannels yellow. Borax softens, whitens and cleanses woolens.

TO WASH FEATHER PILLOWS

Dissolve one pound of sal-soda and half a pound of soap in two quarts of boiling water. Pour this into a tub with six pailfuls of warm water. Dissolve half a pound of chloride of lime in a quart of boiling water. Let it settle, then stir into the tub of soda water. Have the pillows well beaten and then put them into the tub, pressing them down with a wooden stick. Soak them for one hour, working the solution through them by means of a stick. Rinse in several waters. Press as free as possible from water. Hang on the line. Turn and shake frequently. Select a bright windy day for this work.

TO DEODORIZE AND RENOVATE FEATHERS

Put the feathers in a large bag of white mosquito netting and soak them for two hours in chloride of lime water, then rinse in several waters and dry in the open air. The feathers must be put loosely in the bag and the bag shaken frequently while they are drying. Allow half a pound of chloride of lime to eight pailfuls of water, and be sure that all the lime is dissolved.

TO CURE FEATHERS

To cure feathers, dissolve two pounds of quicklime in two gallons of water. Let the mixture settle, then pour off the clear liquid. Soak the feathers in this for four days, then rinse in several clean waters and dry.

TO CLEAN LIGHT AND DARK FURS

For light furs, mix together a pint of flour, a pint of bran and a tablespoonful of fullers' earth. Brush and shake the furs; then lay them on a table and rub with the above mixture, using a coarse piece of flannel, and rubbing the wrong way of the fur. Shake out all the cleaning material and go over the fur again in the same way, using only bran this time. Shake out the bran and wipe the fur with cheesecloth. Dark furs are cleaned in the same way, save that hot bran alone is used. Heat the bran in a double boiler, or it may be heated in the oven.

TO DRY CLEAN WHITE KID

Belts, shoes, gloves, etc., of white kid may be cleaned in the following manner: Mix together equal quantities of finely powdered alum and pipe clay or fullers' earth. Dip a piece of flannel in the dry powder and rub the soiled kid with it. When thoroughly cleaned brush with a piece of clean flannel, and then rub the kid with bran to remove all the earth and alum. Wipe with a soft clean cloth.

TO LAUNDER SILKS, PONGEES, AND SILK EMBROIDERIES

Make a strong suds with a mild white soap. Have a weak suds in a second tub. Wash the articles in the strong

suds, using the hands for rubbing. Wash again in the weak suds, and then rinse in plenty of clear cold water. Press the water from the silk, but do not wring. Shake out the wrinkles, then spread on clean sheets and roll tight. The water for washing silk must never be more than tepid. This treatment is for pongees, white and light-colored silks. If the white silks are very much soiled add a little dissolved borax to the first washing water. To iron, place a piece of cheesecloth between the silk and the iron. Do not use a very hot iron. Never let any part of the silk dry before ironing. If by any chance it should become dry, roll it in a wet cloth to dampen it. Sprinkling water on the dry silk is apt to spot it. Silk underwear should be dried on the line and then pressed with a warm iron.

Silk embroideries should be pressed on the wrong side. The iron should be a little hotter for embroidery than for silk.

THE IRONING OF STARCHED ARTICLES MADE EASY

Dry the starched articles perfectly, then dip them in a pail of boiling water and pass them through the wringer twice. They may then be ironed at once, or they may be rolled up in a dry cloth. The fabric may be ironed with greater ease after being dampened in this way than when sprinkled in the usual manner.

STARCH LUSTER

Soak, for six hours, one ounce of the best white gum-arabic in one quart of water; add two ounces of borax and heat to the boiling point, then add one ounce of glycerine. Cool, strain and bottle. Stir one tablespoonful of this luster into three quarts of starch made as directed above.

TO CLEAN CHAMOIS GLOVES

Make a strong suds with white castile soap, or any other kind of good white soap, and to two quarts of suds add one teaspoonful of borax dissolved in half a pint of hot water. When the suds are cold, put the gloves on the hands and wash them slowly and gently, as if washing the hands. Rinse in the same manner in clear water; then draw off gently and hang in a shady place to dry, drawing them into shape when they are almost dry. When perfectly dry, rub them between the hands to soften them. When the chamois is wet it is tenderer than when dry, so it is important that the work be done gently.

TO RENOVATE CRAPE

A large piece of black crape or a veil will require great care that it may not be drawn out of shape. Tack several thicknesses of dark flannel smoothly and firmly on a board. Spread on this board as much of the crape as will lie smoothly. Pin the edges to the flannel. Wring a large crash towel out of water, being careful not to make it too dry, and spread it over the crape. Have two or three very hot irons; go over the towel with an iron, being careful not to let the weight rest on the crape. Change the iron as often as it is necessary to have it very hot to produce steam. When one part of the crape is finished move it along and treat the next section in the same manner, pinning and covering with the wet towel as before. When every part has been steamed lay the crape on a flat surface and in a dry atmosphere for ten or twelve hours. When perfectly dry it will be ready to use.

TO SET COLORS IN COTTON FABRICS

Sugar of lead, I think, is the best all round mordant. Prepare by dissolving one ounce of sugar of lead in eight quarts of water. Soak the article over night in this liquid. In experiments with the sugar of lead solution I found it darkened reds and yellows, lightened greens, and deepened blues slightly. Remember that sugar of lead is a poison. Do not leave the powder or solution within reach of children. When you have finished with the liquid pour it into the drain, and not on the ground, where it might filter into the well.

HOW TO REVIVE COLORS IN COTTON FABRICS

For several years I have been making experiments with faded fabrics. The results have been unequal, so much depends upon the dyes and other conditions. For example, the agent that will revive and brighten one sample of red will give a purplish tinge to another. Some dark blues were brightened while other samples were given a dull or purplish tinge. Light blues were sometimes given a greenish tinge. The tendency of all yellows seemed to be toward a suggestion of brown, no matter what chemical was used. In some cases this was so slight that it would not be observed except by close inspection. Here is a list of what seems to me the simplest and most useful revivers the housekeeper can use. Read this list carefully and select the agents that seem the most desirable for the colors you wish to revive. The article should soak for an hour or more in the reviver.

REDS—Citric acid deepened the color many shades.
Acetic acid slightly darker and brighter.

Alum deepened and dulled the color.

YELLOWS—Alum brightened the color.

Acetic acid, lighter and brighter.

GREENS—Citric acid deepened the color several shades.

Acetic acid, nearly the same effect.

BLUES—Acetic acid deepened and brightened.

Citric acid, several shades deeper than acetic.

Sulphuric acid deepened and brightened some blues; to some navy blues it gave a purplish tinge, and to some light blues it gave a greenish tinge.

The proportions used were as follows:

ALUM—Four tablespoonfuls to a gallon of water.

ACETIC ACID—Four tablespoonfuls to a gallon of water.

CITRIC ACID—One ounce of the crystals to a gallon of water.

SULPHURIC ACID—Two tablespoonfuls to a gallon of water.

TO WASH ORIENTAL RUGS

Have the rugs spread face down on the grass and beat well. Turn them over and sweep. Now spread the rugs, face up, on a clean floor, where they can have plenty of air, and remain until dry.

Dissolve one pound of Ivory soap in two quarts of boiling water. Add to this a quarter of a pound of borax dissolved in two quarts of boiling water. Stir well and add a gallon of cold water. Have a new *soft* scrubbing brush, plenty of clean, dry cloths, two pails of clean cold water, a large sponge, and a broad, deep pan. Put some of the cleaning preparation in the pan. Dip the brush in the mixture and scrub about half a yard of the rug. Wash off with the sponge and clear water until perfectly clean, then wipe as

dry as possible with the dry cloths. When this is finished, clean another piece of the rug, and continue until the entire rug is finished. Dry in the sun.

Any rug or carpet that has fast colors may be treated in the same manner.

TO CLEAN WITH FULLERS' EARTH

Make a suds with a good white soap and hot water; make this the consistency of thin cream with fullers' earth. Have plenty of clean drying cloths, a small scrubbing-brush, a large sponge and a pail of fresh water. Put some of the cleaning mixture in a bowl and dip the brush in it; brush a small piece of the carpet with this; then wash with the sponge and cold water. Dry as much as possible with the sponge, and finally rub with dry cloths. Continue this till you are sure that all the carpet is clean; then let it dry.

SOAP FOR CLEANING CARPETS

Dissolve five pounds of soap in three quarts of water. Take from the fire and add a half pint of ox gall, two ounces each of turpentine and benzine, and one gill of household ammonia; stir frequently until cool, then pour into glass jars and cover tightly. When ready to clean carpets or other fabrics dissolve some of the soap in warm water and proceed as with fullers' earth mixture used for cleaning carpets. Of course, it is understood that the carpet or fabrics must be brushed free from dust before the cleaning begins.

TO RESTORE THE COLOR TO WORN PLACES IN CARPETS

Get a small box of water-colors. Select a color to match that which you wish to restore. If you have not the right

shade combine colors to produce it. Use enough water to make the coloring liquid very thin. Apply with a brush.

GREASE SPOTS ON A CARPET

Cover the spots with fullers' earth, then wet with turpentine. Cover the paste with paper. In two days remove paper and brush off the dry paste.

MENDING ON THE SEWING MACHINE.

There are few busy women who have not done some kinds of mending on the sewing-machine. Few, however, realize how satisfactorily many kinds of darning can be done.

Points to Remember: For thin, fine material use fine thread; for coarse material the thread may be between eighty and sixty, nothing coarser. When darning colored goods let the cotton or silk be the same color as the material to be darned. Hold the work smooth, and guide it the same as in ordinary stitching. When turning the work be sure that the needle is well in the goods. If the needle is lifted above the cloth a loop of thread will rest on the darned surface. For thin material loosen the presser foot screw and shorten the stitch; for heavy material do not loosen the presser foot. Set the stitch fairly long.

Darning Household Linen. Loosen the presser foot screw, shorten the stitch, thread the machine with fine cotton — about one hundred. Put the thin, frayed or torn place in position, holding it smooth, but being careful not to draw it. Begin the stitching a little beyond the damaged place. For places that are worn thin or frayed put in rows of stitching, close together. Cross these with other rows of stitching; this will give a smooth, fine texture. If there are decided holes in the article baste a piece of Brussels net, or thin muslin, on the wrong side and darn the same as on a worn

surface. If it is a slit or any kind of a tear hold the edges together as you guide the work, and stitch back and forth, having the rows of stitching wide apart. Cross this stitching with other rows a little closer. If the mended place looks thin, where the edges are brought together, put two or three rows of stitching up and down the length of the rent.

What May be Done with Underwear. Straight tears in underwear may be mended in the same manner as tears in sheets, etc. Torn embroideries can be held together, or, if the tears are large, may be lightly basted and then darned the same as household linen. Parts of garments that are worn thin can have a piece of thin muslin basted on the worn part, and then be stitched over until the article is as firm as when new. Cotton, silk and woolen undervests and drawers may be darned the same as table linen, but great care must be taken to keep the fabric drawn out smooth. When these garments are worn thin at the knees or in the seat, a piece of an old garment of the same kind can be basted smooth on the worn place, and then be darned over. If the old garment is not available use some kind of net; for white or cream color, Brussels net is very good.

Stockings, because of their shape, cannot be darned in the feet, but at the knees, where children wear them so rapidly, and near the top, where they are frequently injured by the garters, they may be darned neatly and quickly on the machine. If there is a large hole baste a piece of net on the under side, and then darn quickly over this.

Men's, Women's and Boys' Cloth Garments. Tears and worn places in cloth fabrics can be darned most satisfactorily on the sewing-machine. Thread the machine with silk or cotton of the same color as the fabric. Do not loosen the presser foot; have the stitch of moderate length; darn the same as household linen, but the rows of stitching must be very close. Where the fabric is worn thin baste a piece of the same kind of goods on the wrong side, and darn over

it. If there is none of the same material a piece of net or muslin will answer. If the colors in the fabric are mixed have the upper thread of the machine of the most pronounced color and the under thread of the minor color.

CARE OF THE HANDS

Housework is rather hard on the hands, but there are some precautions which, if taken, will add greatly to the comfort of the worker and the appearance of the hands. Among the things which roughen and blacken the hands, the most important are dust, soap, fruit, vegetables, and neglect to properly dry the hands. Wash all vegetables before paring. When the hands are stained by fruit or vegetables be sure to remove the stains before the hands come in contact with soap or soapy water. Remove the stains with an acid, such as lemon, vinegar or sour milk, then wash in clear water. When using soap and water for any purpose. be sure to rinse off all the soap before wiping the hands. Always wipe the hands perfectly dry. Do not change soaps if you can avoid it, and always use a good soap. When sweeping and dusting, wear loose-fitting gloves. Have a pair of rubber gloves for use when it is necessary to have the hands in water a great deal. Grease spoils rubber, therefore the gloves must be washed perfectly clean as soon as the work is finished A little bran and milk or vinegar will make the hands clean and smooth after dish-washing or any other work that roughens them. With a little practice one can wash dishes as well and as quickly with a dish-mop as with a cloth and the hands. There should be two mops, one for the tableware and one for the cooking-dishes. For washing floors have a self-wringing mop. To soften and whiten the hands use some sort of cream on them at night, then powder them with corn-starch, and put them in loose gloves, kept for this purpose.

PREPARATION FOR SOFTENING AND WHITENING THE HANDS

Put into a bottle two ounces of glycerine, the juice of two lemons and a few drops of carbolic acid. Shake well. Add two tablespoonfuls of water and shake again. After washing and wiping the hands rub a little of this mixture into them. Carbolized mutton tallow may be rubbed into the hands at night. After rubbing in the tallow, powder the hands with dry starch. Put on loose gloves.

CARBOLIZED MUTTON TALLOW

Cut a pound of mutton suet into fine shreds and put it in a stone or earthen bowl. Place the bowl in a pan of hot water on the range, stirring frequently until there is enough of the melted tallow to fill a half-pint cup. Turn this tallow into a bowl, and as it begins to thicken beat into it half a teaspoonful of carbolic acid. This is excellent for chapped hands, and is also good to rub on the feet when they are tired or when one has chilblains.

TOOTH POWDER

Mix together two ounces of precipitated chalk, one ounce of powdered orris root and two tablespoonfuls of powdered white castile soap. Now rub through a sieve several times. Keep in a closely covered jar. To prepare the powdered soap, cut into thin shavings, dry, and then pound and sift. A little powdered camphor may be added to the tooth powder.

SUNBURN REMEDY

Have the druggist put the following ingredients into a large bottle: One pint and a half of orange-flower water,

half a pint of elder-flower water, two fluid ounces of tincture benzoin, half a fluid-ounce of cologne water, four grains of camphor, sixty grains of ferrous sulphate, a quarter of an ounce of citric acid. Keep a small bottle of this mixture on your dressing-table and rub it on the hands and face night and morning. Shake the bottle well before using the contents.

TO CURE CONTRACTED MUSCLES CAUSED BY A BURN

To cure contracted muscles caused by a burn: The treatment should begin as soon as the burn is healed. Dissolve one ounce of Epsom Salts in four ounces of water. Keep the muscles wet with this liquid through the day and as much as possible through the night. The best way to do this is to have a soft cloth wet with the liquid, and bound on the contracted muscle. The cure is slow, but sure. This remedy has recently been discovered by a surgeon. One of my friends has been saved a surgical operation by this treatment, and is so grateful that she desires the knowledge to spread.

CONCERNING HOUSEHOLD INSECTS

To the bringing into our homes of fabrics, furniture and household supplies from all sources, in these days of universal travel, there may be charged the introduction into our houses of some of the most annoying of destructive insects. If one knows something of the life cycle of these insects one can proceed intelligently in the work of exterminating them. A description of a few types and the remedies will give the housekeeper the key to the best methods of protecting herself from these pests. Additional remedies will be found on pages 341 to 346. The U. S. Department of Agriculture has published some valuable Bulletins on household insects. If you cannot find these in your Public Library send to Washington for them.

CLOTHES MOTHS

There are four stages in the life of the moth: the egg, the larva, the pupa, the moth. The moth generally deposits its eggs where the larva may find suitable food—that is, in furs, feathers and wool materials.

The larva emerges from the egg in the form of a worm which immediately begins to feed upon its surroundings. It makes a case for itself with particles of the materials upon which it feeds, and moves about in this. If the article in which the eggs were deposited is soiled the development of the larva is rapid, and as a consequence the destruction of the material is greater than it would have been had the article been clean.

When the larva reaches full growth it fastens itself to some substance, generally the article on which it has been feeding. In about three weeks the moth emerges from the case and soon begins depositing eggs for a new generation. Now, although the moth does not directly injure fabrics, it supplies the eggs from which the destructive larvæ are hatched. When moths are seen flying about there is every reason to suspect that the eggs are being deposited.

Before putting away woolens, furs or feathers see that they are as clean as possible. Wearing apparel should have all the pockets turned inside out, all the seams and hems brushed, and then be well shaken and aired. Clean all soiled places with benzine or turpentine. If there is any danger of eggs having been deposited in furs carefully comb the furs, using a steel comb. Pin the articles in cotton bags. Put them in boxes or closets that have been made insect and germ free by carbolic acid. Put bits of cotton wet with oil of cedar in the boxes or closets, or cedar chips or camphor may be used.

From early spring until late fall, carpets, upholstered fur-

niture and woolen garments hanging in closets in constant use should be brushed, beaten and aired frequently.

SPRAY FOR MOTHS

Spray for moths is made by mixing together one quart of alcohol, one ounce each of carbolic acid crystals and camphor, a quarter of an ounce each of oil of cedar and oil of eucalyptus. Keep the bottle well corked. Put some of the liquid in an atomizer and spray the places where the moths appear.

TWO DESTRUCTIVE CARPET-BEETLES

There are two well-known species of these beetles in this country: the buffalo-bug and the black carpet-beetle. The buffalo-bug is less than a quarter of an inch long; it is covered with minute scales which give it a marble appearance; it has a red stripe down the middle of the back. At a first glance it might be taken for a lady-bug. Unlike the moth it likes the light and will often be found on window casings and draperies. In summer it will fly from the house to the garden. The eggs hatch in a few days. The larva is a dark, hairy oblong, which breaks like powder under slight pressure. When the larva is full grown it passes to the pupa stage, and from that to the beetle. As with the cloth moth, it is the larva that injures fabrics and various materials. It does not confine its destructive work to carpets, but will eat through silks, woolens, feathers, and sometimes even cottons. It is easier to trace the carpet-beetle than the cloth-moth because the beetle does not shun the light, and the larva is not concealed in a case of the material upon which it is working.

The precautions and remedies for this insect are practically the same as for moths. When cleaning out closets,

boxes and drawers, spread an old sheet on the floor and shake the articles over it. The larvæ will drop off readily, and may be crushed at once. Hang the infested articles in the air; spray the closets, boxes, drawers, cracks of floors, etc., with carbolic acid or naphtha.

The black carpet-beetle is oval, black, and a little longer and narrower than the buffalo-bug. The larva is long and round, the body ends with a tuft of hair. The color of the body is light brown. Its habits are about the same as the buffalo-bug and the treatment should be along the same lines.

ONE OF THE MOST DREADED PESTS

Bedbugs are liable to find their way into any house or apartment, but it is the housekeeper's fault if they find lodgment there. As with all other insects, perfect cleanliness is the greatest safeguard. If they are found in a room immediate action should be taken. There are many agents for exterminating these bugs, but my preference is for naphtha. It is clean, does not injure anything, is easily applied, and is absolutely sure if enough is used in the right place. The only drawback is that the vapor is very inflammable, but if the work is done in the morning with the windows open, and there is neither light nor fire in the room, there is not the slightest danger. It must be remembered that these insects do not confine themselves to the bed. They get into picture moldings, the backs of pictures, cracks in floors and walls, and in upholstered furniture.

The following wash will exterminate the pests. Mix together in a large bottle half an ounce each of corrosive sublimate and powdered camphor, half a pint each of wood alchohol and turpentine; have the room cleaned and apply the wash with a small brush. Force it into the cracks and grooves in floors, walls and furniture, and carefully brush it

over the backs of picture frames and the tops of picture molding. Do not use enough to run on the walls and furniture as it soils badly.

Oil of red cedar will exterminate the pests. Another method is to fumigate with sulphur.

THE DOMESTIC COCKROACH

Some species of this insect are to be found in all countries and climates. It is so well known that it needs no description here. It generally confines itself to the kitchen and back parts of the house where heat, moisture and food are to be found. These insects collect in old wood and boxes of papers. Hotels and apartment houses are liable to have this pest, but if one has full control of a house there need be no difficulty in keeping it free from them. Perfect cleanliness in the kitchen, pantries, cellar and backyard is all that is required. All garbage should be burned if possible. If cockroaches are in the neighborhood they will be attracted by kitchen refuse, soiled and damp floorcloths and dish-towels, particles of food, particularly fats, etc. If these insects get into the house, spray with carbolic water all the cracks in walls and floors where they are seen, and use some one of the many non-poisonous preparations that are sold for this purpose. There is a powder [Roachelene] sold, which really exterminates them; they are attracted by it, eat it and shrivel up until they are reduced to a speck of dust. This process of exterminating them is much better than driving them to one's neighbors.

SILVER MOTHS AND SILVER FISH

Under these two heads, and also as bristle-tail, silver witch, etc., is known an insect that is destructive to paper books, starched articles and some kinds of food. The

bristle-tail is about one third of an inch long, tapering from the head to the end of the body, which ends in three thread-like caudal appendages. It is silvery white with a tinge of yellow in the legs and abdomen. It finds its way to every part of the house, even under the wall paper, where it feeds on the paste. The remedies for this pest are plenty of light and air, frequent brushings of every part of the room, insect powder injected into crevices, and sprayed on walls, floörs and shelves. Rooms infested with these pests may be fumigated with sulphur, or have a thorough treatment with naphtha or carbolic acid. Oil of cedar is also good.

Use the same remedies for the spring-tail and the book-louse, should they at any time appear in any part of the house.

ANTS

Of all the insect pests which trouble the housekeeper there are none that are so difficult to deal with as these interesting little creatures. To understand the difficulty of exterminating either the black or red ant one must know something of their habits. Here is a brief outline which will aid the housekeeper in carrying out a successful plan for the extermination of these pests. Ants live in colonies and are divided into males, females and neuters. The neuters do the work. The males and females rarely leave the colony. The swarms of ants that appear in the house are composed of neuters. The destruction of these ants will lessen the nuisance, but the insects cannot be exterminated in this manner, for others to replace them will be produced in the colony. The colony or nest must be found and the males and females destroyed. This is a difficult matter, and and it is only by patient watching that one is able to follow the ants to their home. The colony may be in the soil outside the house, in which case it is easily found; or it may be

in the walls, or under the floors of the house, where it is more difficult to reach them.

To exterminate ants trace them to their home. To do this it may be necessary to remove part of a floor or the baseboard of a room. Wherever the nest is found such measures must be taken as shall kill all life in it. If the nest is in the house saturate it with kerosene oil or with boiling water. If the nest is in the ground have a long sharp-pointed stick, which press into the nest, remove quickly, and pour about two ounces of disulphide of carbon into the hole; close at once by pressing the foot on the hole. Proceed in this manner until six holes are made, filled and closed. The fumes of disulphide of carbon will penetrate to every part of the nest, destroying all life. Be careful not to breathe the fumes of the chemical, and be very careful not to have light or fire near when using it. A lighted candle, cigar or pipe might cause an explosion.

Ants may be trapped in either of the following two ways: Cover plates with a thin coat of lard and set them in the places infested by the insects. Place little sticks at the side on which they can mount to the plates. When the plates are full drop them into a pan of hot water. Or, wet sponges with sweetened water and place them about. When full of the insects drop into hot water.

Strong odors will sometimes drive away these pests, but as a rule one does not want to use such odors where there is food. Among the odors that may be used are oil of pennyroyal, oil of cedar (a few drops put on bits of cotton, which are then placed in the infested places), or gum camphor.

To protect food keep it as much as possible in closely covered tin boxes, or in the refrigerator, or on tables which are protected by having the legs placed in four dishes, in each of which there has been poured some tar water, to the depth of about four inches.

FLEAS AND REMEDIES FOR THEM

These insects hide in floors and walls, and in and under carpets. As a rule any of the following methods will eradicate them: A thorough treatment of the room with naphtha; taking the carpets and upholstered furniture out-of-doors and saturating them with naphtha; cleaning the room with carbolic water, injecting it into all cracks and ledges; spraying every part of the room and furniture with insect powder. Often a thorough sweeping, brushing and airing are all that is required to rid a room entirely of these pests.

SPRAY FOR FLEAS AND MOSQUITOES

Dissolve two ounces of oil of eucalyptus in one pint of alcohol. Into another bottle put two ounces of oil of bay and add two ounces of ether. Cork the bottles tight and shake occasionally. When the contents of both bottles are dissolved pour the alcohol mixture on the ether mixture. Use this with an atomizer, spraying the localities in the room where the fleas or mosquitoes are. The fleas are generally in the lower part of the room, while the mosquitoes are usually on the upper parts of the walls and the ceiling.

HOW TO EMPLOY OIL OF CEDAR

Oil of red cedar will kill all insects. Open all boxes, drawers, closets, etc.; wet little wads of cotton batting with oil of red cedar and scatter about the room, being careful not to let them come in contact with clothing or furnishings, as the oil makes a bad stain. Close the room as tightly as possible to keep in the strong odor. If possible keep the room closed for two days. If you cannot get the oil of red cedar, use about four times as much of the common oil of cedar. It

will take about three ounces of oil of red cedar for a large room.

HOW TO FUMIGATE WITH SULPHUR

Take all metals and colored fabrics from the room; paste strips of paper over the cracks of windows and doors; put an iron or tin pan in the middle of the room, and in it put water to the depth of three inches. Put a couple of bricks in the pan, and on these place an old iron pan in which you have put a bed of burning charcoal. Throw a few ounces of finely-broken sulphur on this and close the door. Do not open the room for twenty-four hours. Sulphur candles may be employed in place of the charcoal and sulphur. This method is effective for carpet bugs, bed bugs, moths, and disease germs.

HOW TO SEAL A ROOM

When getting a room ready to disinfect it is important that it should be sealed so tight that but little of the disinfecting fumes shall escape, and also that the sealing agent shall be easy to remove. Here is a method that is simple and clean: Soak two teaspoonfuls of powdered gum tragacanth in one pint of cold water for an hour, then place the bowl in a pan of boiling water and stir frequently until the gum is all dissolved. Have newspapers cut into strips about two inches wide and paste six thicknesses together. Paste these over the cracks of doors and windows, leaving the door by which you leave the room to be sealed after the fumigator is lighted. If there is a fireplace in the room it must be covered with several thicknesses of thick brown paper. The gum tragacanth is easily washed off and does not discolor either paint or woodwork.

PUTTING AWAY WOOLENS AND FURS

Many a housekeeper packs away her furs and woolens with fear and trembling, not knowing what may be their condition when they are unpacked in the fall. In many cases there certainly is reason for this fear, because the articles have not been thoroughly cleaned. If moths or their eggs are left in the folded articles there is sure to be a large colony of larvæ, which will eat its way through all the woolen and fur articles in its vicinity. On the other hand, if closets and other receptacles are made absolutely clean, and then treated with some insecticide, and if the garments are made perfectly free from insects and their eggs, the housekeeper can go away with an easy mind.

When ready to put away furs, feathers or woolens have some clean sheets or cotton bags. For garments that are to be hung up, the bags are better than sheets. Have the closets or boxes made clean as directed. Brush the furs and shake well. Hang in the sun for several hours. If you have a suspicion that there are eggs in the furs comb each piece of fur well. Pin the articles in the sheets, and on the sheets pin little wads of cotton batting, dampened with oil of cedar. Paint the joining of the boxes with oil of cedar then line with paper. When the box is full cover with paper, put on the regular cover, and put away in closet or storeroom.

Feathers and all woolen garments are treated like furs. I am sure that if these instructions are followed no kind of an insect will appear in either closet or box. The odor of oil of cedar is very strong, but passes off in a few days when there is thorough ventilation. Of course it is important that this odor should be retained in closets and boxes, and for this reason they must be closed tight. Oil of cedar

makes a reddish-yellow stain which it is hard to remove; therefore it should not come in contact with the clothing. The sheets used should be kept solely for packing purposes. A small unstoppered bottle of chloroform put in a corner of the packing box will protect the contents from moths or carpet bugs.

HOW TO PREPARE A HOUSE FOR CLOSING

When closing the house for a month or more take such precautions that you may be sure of finding it sweet and healthful on your return. Have rugs cleaned and packed away the same as other woolens. Take down, clean and put away all draperies. If you have upholstered furniture give that a good beating and brushing. Have the house thoroughly swept and dusted. Have the floors in kitchen, pantries and laundry washed with water to which a little carbolic acid has been added. Flush the plumbing with carbolic acid water; then a few hours before you leave the house flush with hot sal-soda water—one pound of the soda to a gallon of water; for the kitchen sink and set tubs make it two pounds of soda to the gallon of water. Soda is cheap, so be generous with the flushing liquid. The house is protected from sewer gas by the water seal in each waste-pipe—that is to say, water to the depth of a few inches is supposed to remain at all times in each trap, but when the plumbing is not used for weeks at a time this layer of water is evaporated, the seal is broken and sewer gas pours into the house. To prevent the evaporation of the water in the trap, just before leaving the house pour a few spoonfuls of sweet oil into each trap.

Have everything in the way of cereals, or anything eatable, and gums, such as gum-arabic, tragacanth, etc., also candles, matches, etc., in metal or stone receptacles, that the mice may have nothing to attract them. If you have

carpets on your floors strew bits of cotton, on which you have poured oil of cedar, along the edges of the carpets. I would use this oil in every part of the house. The odor is so overpowering that it cannot be employed in quantity until you are about to depart.

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